

- - Ohio Turnpike - - - Opportunity Analysis



Final Report

Prepared for the State of Ohio

by KPMG Corporate Finance LLC
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Executive Summary

The Ohio Turnpike (“Turnpike”) is a critical transportation asset to the State of Ohio (“State”), and is a vital 241 mile route supporting commerce and economic activity in Ohio, across the Great Lakes, and the eastern half of the United States. For nearly 60 years, the Ohio Turnpike Commission (“OTC”) has operated and maintained the Turnpike using revenues generated by the Turnpike, primarily toll revenue.

Like many roads of its age, the Turnpike requires significant capital investment. The total estimated cost of pavement reconstruction and other major capital improvements ranges from \$2.9 to \$3.3 billion (in 2012 dollars) over the next 50 years. At the same time, the State must address critical infrastructure and transportation needs in a financially constrained environment.

The Ohio Department of Transportation (“ODOT”) and the Ohio Office of Budget and Management (“OBM”) are actively engaged in addressing Ohio’s infrastructure and transportation needs. The Ohio Turnpike Opportunity Analysis (“Analysis”) was commissioned by the State to assess the options available to unlock the value of the Turnpike, while preserving its future viability and quality of service.

The scope of the Analysis includes an assessment of the current and future commercial, financial, strategic and technical needs of the Turnpike. The Analysis is intended to assist the State in understanding its options for unlocking the value of the Turnpike, in order to increase the State’s infrastructure investment and promote economic competitiveness.

First and foremost, the State identified the following overarching objective of this analysis:

Be a good steward of Ohio infrastructure assets by unlocking value to grow Ohio’s economy and maximize job creation.

The State developed more detailed goals for the Analysis as well, and these principles, described below, have formed the basis for the development of the options considered in the Analysis:

- Maintain Turnpike Ownership – At all times, maintain State ownership of the Ohio Turnpike;
- Benefit Northern Ohio Communities – Attempt to obtain the maximum benefit for the communities surrounding the Ohio Turnpike;
- Fair and Predictable Toll Rates – Remain cognizant of the financial burden imposed on Turnpike users, particularly local Ohio commuters and businesses;
- Manage Diversion – Limit truck diversion onto parallel routes;
- Upfront Payment – Generate proceeds to invest in major new highway projects over the next five years;
- Revenue Share – Generate a long-term revenue stream for future use; and
- Promote Job Creation and Economic Growth – Invest proceeds in infrastructure projects that generate jobs and economic development.

Ohio's Transportation Needs

Like the vast majority of states, Ohio's transportation budget is dependent on dwindling federal and state gas tax revenues and funding has not kept pace with the cost of Ohio's transportation needs. Federal funding for transportation is not anticipated to increase. Most recently, the Moving Ahead for Progress in the 21st Century Act ("MAP-21") legislation, enacted into law by Congress in July 2012, maintained federal funding for surface transportation programs but did not increase the gas tax or otherwise increase overall funding levels in a meaningful way. In fact, Congress was only able to sustain funding levels by making select accounting and policy decisions that may not be available in the future¹.

According to the American Society of Civil Engineers ("ASCE"), Ohio has one of the largest roadway systems in the U.S. and the system is heavily used, causing significant asset deterioration.² The State's highway system is integral to maintaining economic activity and encouraging a business friendly climate to support Ohio's many industries, particularly manufacturing and agriculture, which rely on the system to move goods throughout the Midwest. Yet, ASCE found that 43% of Ohio's roads achieved "critical", "poor", or "fair" condition status.

As a result of the previously referenced funding shortfall, the Ohio Transportation Review Advisory Council ("TRAC"), which establishes the funding plan for ODOT's major transportation projects, recently delayed \$1.4 billion of its highest priority construction commitments. In the TRAC's 2013 to 2016 program, 21 projects were delayed up to 13 years from their original start dates. Critical delayed projects include:

- Mahoning Road Transit Corridor;
- Phases 2-5 of Interstate-70 / Interstate-71 in Columbus;
- Cleveland Lakefront West;
- Columbus North Outerbelt; and
- Interstate-75 through Hamilton County.

To accelerate projects in the TRAC program, ODOT is evaluating a wide range of options for funding or financing its projects. Between January and June 2012, ODOT identified \$400 million in savings to help offset the TRAC project funding shortfall announced in January. ODOT also launched the Division of Innovative Delivery (the "Division") in March 2012 to explore a range of innovative methods for delivering projects. Seeking new solutions, such as unlocking the potential of the Turnpike, is a key element of ODOT's overall approach to addressing the State's transportation system challenges.

¹ <http://www.cbo.gov/sites/default/files/cbofiles/attachments/hr4348conference.pdf>

² "2009 Ohio Infrastructure Report Card: Roads Fact Sheet Grade: D," *ASCE American Society of Civil Engineers*, May 2009.

Scope of the Analysis

This report summarizes the Analysis commissioned by the State. The advisory team was not asked for a specific recommendation on the direction to pursue. Rather, the State requested an objective, comprehensive analysis of the relative advantages and disadvantages, monetary benefits and implementation considerations of each respective option considered herein. In conjunction with legal analyses provided by the State's legal advisory team, the objective of this approach is to help the State to make an informed decision regarding future plans for the Turnpike. The work performed by the advisory and legal teams encompassed four primary work streams:

- **Technical** – A technical assessment of the Turnpike was performed with regard to current operating standards, maintenance practices, and long term requirements for maintaining the Turnpike in quality condition. This initial step identified the current cost and revenue structure of the Turnpike, and forecast operations, maintenance, capital, and lifecycle costs for each of the options under consideration. The technical work stream also included the development of traffic and revenue forecasts, and analyzed the impact of various scenarios on potential diversion of traffic onto parallel routes.
- **Financial & Commercial** – The team conducted a financial and commercial assessment of Turnpike alternatives. The State identified and defined policy objectives, considerations and constraints with respect to the options under review. Market soundings were conducted with private sector participants, including infrastructure debt and equity investors, municipal finance banks, developers and operators. The allocation of risks under each option was assessed to help refine and formulate commercial structure alternatives for the Turnpike. Financing assumptions and key terms were developed for each of the respective options, and various financial analyses were performed.
- **Communications** – The team assisted ODOT in developing a comprehensive communication strategy including a plan for soliciting input from local, regional and national stakeholders to better inform the analyses. Stakeholder outreach and information gathering was effected through a wide variety of forums and venues, as detailed in this report.
- **Legal** – Through the Office of the Ohio Attorney General, Barnes & Thornburg (B&T) was engaged as the State's legal counsel. B&T's work included advising on state law issues as well as advising on issues related to existing OTC indebtedness, including the potential defeasance of existing Ohio Turnpike Commission debt, as required under certain alternatives. To supplement the work of B&T, the law firm of Allen & Overy provided legal implementation advice with regard to the Public-Private Option. The legal advisor scope includes a review of current OTC law, which limits the expenditure of toll revenues to within one mile of the Turnpike. Accordingly, the legal team has provided advice regarding potential amendments to the law to enable greater flexibility in the use of toll revenues and bond proceeds.

Overview of Options

The Analysis addresses three options that seek to best achieve the goals for the Turnpike identified previously. The first is a status quo option with modifications to OTC's bonding capabilities ("Status Quo with Increased Bonding Capacity"). Second is a public option ("Public Option"), which considers a closer alignment between the OTC and the Ohio Department of Transportation. The third is a long-term public-private partnership option ("Public-Private Option"), which assumes a Turnpike lease to a private concessionaire ("Concessionaire") for a period of 50 years. Each of these are described in greater detail below.

Status Quo with Increased Bonding Capacity

Overview

Under the Status Quo with Increased Bonding Capacity, the Analysis assumes that the governance, and operations and maintenance programs, of the OTC remain largely unchanged, while the OTC policies and practices for financing projects is revised to enable the OTC to take greater advantage of future revenue growth. Currently, the OTC is not permitted to leverage the forecast growth in future revenues, due to restrictions incorporated into the OTC's bond trust indenture, which calculates bonding capacity based on the previous year's net available revenue. By revising such restrictions, the OTC may create additional borrowing capacity.

Governance and Oversight

The Status Quo with Increased Bonding Capacity alternative assumes that the OTC retains governance and oversight of the Turnpike.

Key Considerations

In evaluating the Status Quo with Increased Bonding Capacity, key considerations include:

- Can the OTC restructure its borrowing program, and modernize its master trust indenture, to protect existing bondholders while significantly increasing bonding capacity?
- Will the OTC make the critical toll adjustments necessary to realize the full value of the Turnpike? Historically, many public agencies have subsidized tolls with adjustments lower than the rate of inflation, and/or lower than demand would dictate, due to the policy or political challenges of raising tolls on a regular basis.
- How will debt levels impact the OTC's ability to ensure that capital costs are covered and operations and maintenance needs are addressed?
- How does the OTC ensure the amount of debt issued is supportable at targeted rating levels?
- Will the current favorable municipal bond markets continue throughout execution of the program? In the case of subsequent bond issues, how will changes in market conditions affect the plan?

Public Option

Overview

Under the Public Option, the Analysis assumes OTC would be more closely aligned with ODOT. The Turnpike would be maintained to the same standards that ODOT upholds for Ohio's interstate system, and the OTC would continue to be responsible for financing any capital expenditures needed to maintain the Turnpike, as well as leveraging future cash flows to enable funding of critical highway projects.

By more closely aligning management of the Turnpike with the other roadways or highways under ODOT's purview, potential savings could be achieved through avoidance of duplicative processes and streamlining of operations. In the Public Option, the Analysis assumes that many of these potential savings are realized through OTC's collaborative relationship with ODOT regarding the Turnpike's operations and maintenance, as well as capital maintenance.

With regard to capital structure, the existing Turnpike Revenue Bonds would not be affected; rather the OTC would issue new bonds secured by Turnpike revenues to generate additional funding for highway

projects. Bond proceeds could be used to maintain the Turnpike in a state of good repair as well as to support other highway projects.

Governance and Oversight

Under the Public Option, the Analysis assumes that responsibility for operations and maintenance of the Turnpike would be closely aligned with ODOT's statewide operations and maintenance program. The OTC would continue to retain responsibility for issuing Turnpike debt. The Analysis assumes that OTC and ODOT would implement operational efficiencies to improve the financial outlook of the Turnpike.

Key Considerations

In evaluating the Public Option, key considerations include:

- Can the OTC and ODOT achieve operations and maintenance cost efficiencies? What opportunities exist to eliminate redundancies and create economies of scale?
- Will the OTC and ODOT make the critical toll adjustments necessary to realize the full value of the Turnpike? As with the Status Quo with Increased Bonding Capacity Option, a risk is that toll adjustments may not be made as required to achieve the results summarized in this report.
- How will debt levels impact the OTC and ODOT's ability to ensure that capital costs are covered and operations and maintenance needs are addressed?
- How does the OTC ensure the amount of debt issued is supportable at target rating levels?
- How favorable will market conditions be for municipal bond offerings? In the case of subsequent bond issues, how will changes in market conditions affect the plan?
- How will the comprehensive risks of Turnpike operations and maintenance be allocated?
- Will future excess cash flows be realized? While the potential value of unencumbered cash flows is significant, there is implementation risk in achieving that value.

Public-Private Option

Overview

The Public-Private Option is assumed to be effected through a concession lease with a private party to operate and maintain the Turnpike for a period of 50 years. Importantly, in this option, the State would retain full ownership of the Turnpike.

As contrasted with the Status Quo with Increased Bonding Capacity and the Public Option, under the Public-Private Option, the State would be required to "defease" (the process of the borrower setting aside the cash necessary to pay off the debt service on the outstanding bonds) any outstanding tax-exempt debt of the OTC. Under this structure the State could receive an upfront payment, or a combination of an upfront payment and a revenue share over the life of the contract. Pursuant to the concession lease the Concessionaire would be responsible for operating and maintaining the Turnpike to predetermined standards. This contractual obligation would ensure that stakeholders, including Turnpike travelers, would enjoy predictable, high-quality service at performance levels pre-established by ODOT.

In addition to operations and maintenance responsibilities, the Concessionaire would be obligated to reinvest certain cash flows back into Turnpike facilities in order to maintain the asset in quality condition. Such long-term asset condition standards would be established for elements such as sub-base and base

pavement, bridges, culverts and structures, service facilities, etc. Additionally, the concession contract would specify certain “handback” requirements (contractual obligations of the Concessionaire to return the Turnpike asset back to the State in a specific condition) to be achieved by the Concessionaire prior to turnover to the State at the end of the concession term. Such requirements would assure the State of receiving the full value of the long-term contract.

Governance and Oversight

Under the Public-Private Option, the Analysis assumes the State would enter into an agreement with a private party to operate and maintain the Turnpike for a period of 50 years. Key policy decisions on toll rates and discounts, performance standards and levels of service would be pre-determined and clearly identified in the concession contract. Pursuant to statute, ODOT would establish and retain enforcement rights over the Concessionaire.

Key Considerations

In evaluating the Public-Private Option, key considerations include:

- Will the Concessionaire operate the Turnpike effectively? The Turnpike is an economic engine for northern Ohio and a critical link among cities, towns and villages. Obligations such as snow clearance are paramount to an efficient transportation system, and assurance of long-term performance of such responsibilities would be critical to the success of this option.
- Will the Concessionaire make the necessary future capital investments in the Turnpike? Estimates indicate that under the Public-Private Option, the Turnpike would require approximately \$2.9 billion of capital investment over the next 50 years. The existing pavement is nearing the end of its useful life and the full 241 miles must be replaced during the duration of this analysis period. Additionally, many bridge structures will need to be replaced over the next 50 years.
- Can innovation in operations and maintenance be achieved? Can the private sector address the Turnpike's capital needs through technology improvements such as innovative pavement design and/or all-electronic “open road” tolling?
- Can private sector operations significantly enhance value?
- Will key stakeholders be adequately protected? Managing future toll increases while limiting traffic diversion is critically important to the residents of northern Ohio as well as Turnpike users. Can the private sector effectively meet these policy goals?
- What is the financial liability to the State if the Concessionaire becomes insolvent or enters bankruptcy?
- Can comprehensive risks be cost-effectively transferred to the Concessionaire?
- How can the State benefit from the ongoing success of the Turnpike through a long-term revenue share arrangement?

Summary of Results

Alternative One: Status Quo with Increased Bonding Capacity

The Status Quo with Increased Bonding Capacity is based on the assumptions and estimates described below. These assumptions are based on the current operations of the Turnpike, and the previously mentioned modifications to the OTC's bonding program.

Assumptions

- The OTC will remain an independent agency;
- The operations, maintenance and capital plan of the Turnpike will mirror present day operations and capital planning;
- Existing OTC debt obligations will remain outstanding and the OTC will remain the issuer of future Turnpike debt obligations;
- New debt secured by Turnpike revenues will be issued under amended guidelines through a new Master Trust Indenture, which will establish new debt covenants for a new "2nd senior" lien and a subordinate lien;
- New toll policies will be established, identifying parameters for target debt service coverage and other key financial and commercial priorities;
- Cash and Electronic Toll Collection ("ETC") toll rates will increase annually based on the change in the Consumer Price Index ("CPI") for the first 10 years; toll policy after the first 10 years will reflect future capital needs of the Turnpike; and
- ETC rates for commuters in passenger vehicles ("Local Trips") will remain constant for 10 years.

Estimates and Model Inputs

Under the Status Quo with Increased Bonding Capacity, the Analysis assumes the Turnpike's operating structure will remain relatively unchanged. Estimated capital improvements would require reinvestment of approximately \$3.3 billion (2012 dollars), excluding service plazas, over the 50 year evaluation period.

Financial Results

The Status Quo with Increased Bonding Capacity Option assumes two new money bond issues, the first of which would occur in the first year of the analysis period (year 1) and the second of which would occur in the fifth year (year 5). This scenario assumes that the first and second series are issued under a revised Master Trust Indenture which permits the OTC to leverage prospective increases in future revenue.

The Status Quo with Increased Bonding Capacity Option results in estimated net bond proceeds of approximately \$1.003 billion for the initial bond issue in year 1 and \$451 million for the second bond issue in year 5 (a present value of \$353 in year 5, discounted at 5.00%). Together, the two issues would provide net proceeds of approximately \$1.454 billion (or a present value of \$1.356 billion discounting the second issue at 5.00%).

The estimated excess cash flows, albeit modest, in the Status Quo with Increased Bonding Capacity option are assumed to be retained by the OTC and utilized at its discretion.

Alternative Two: Public Option

The Public Option is based on the assumptions and estimates described below. These assumptions and estimates define a particular approach to the Public Option for the purposes of this Analysis; however, variations of these policies are possible, and any variation may result in adjustments to the forecasts. In this scenario, operations and maintenance efficiencies are assumed through the OTC's close alignment with ODOT.

Assumptions

- The OTC will remain independent, but will be more closely aligned with ODOT in order to achieve certain operations and maintenance cost efficiencies;
- The OTC and ODOT will re-assess operation and maintenance responsibilities on the Turnpike;
- Existing OTC debt obligations will remain outstanding; however, the existing senior lien will be closed to new debt issuance;
- New debt secured by Turnpike revenues will be issued under a new Master Trust Indenture that will establish new debt covenants for a new "2nd" senior" lien and a subordinate lien;
- New toll policies will be established, identifying parameters for target debt service coverage and other key financial and commercial priorities;
- Cash and ETC toll rates will increase annually based on the change in CPI for the first 10 years; toll policy after the first 10 years will reflect future capital needs of the Turnpike;
- ETC rates for Local Trips will remain constant for 10 years; and
- Facility operations and maintenance will be the OTC and ODOT's responsibility and the Turnpike will be maintained to ODOT interstate standards.

Estimates and Model Inputs

Under the Public Option, the Analysis assumes that the Turnpike's operating structure will be closely coordinated with ODOT. As with the Status Quo with Increased Bonding Capacity, estimated capital improvements would require reinvestment of approximately \$3.3 billion (2012 dollars), excluding service plazas, over the 50 year evaluation period.

The outcome for the Public Option is based on incorporating operations and maintenance efficiencies into the current operating structure of the OTC. This scenario assumes that the OTC would be more closely aligned with ODOT, having certain operations and maintenance guidelines mirror those of ODOT's standards for its Interstate highway operations. Potential operations and maintenance efficiencies assumed include: reduction of Turnpike administrative costs through elimination of redundant functions currently provided by both OTC and ODOT; streamlining of toll collection operations; closure of two maintenance facilities and expansion of the remaining six maintenance facilities; mirroring ODOT maintenance staffing practices in terms of work rules and use of seasonal staff in peak winter months; and streamlining operations of service plazas. The scenario assumes that the OTC will eventually achieve annual cost savings of approximately 21%, compared to current Turnpike operations, within a 10 year period, as estimated by the Technical Analysis team.

Financial Results

The Public Option assumes two new money bond issues, the first of which would occur in the first year of the analysis period (year 1) and the second of which would occur in the fifth year (year 5). For the Public

Option, the first and second issues are placed under a revised OTC Master Trust Indenture which permits the OTC to leverage forecasted increases in revenues.

The Public Option results in net bond proceeds of approximately \$1.003 billion for the initial bond issue in year 1 and \$1.064 million for the second bond issue in year 5 (a present value of \$833 in year 5, discounted at 5%). Together, the two issues would provide net proceeds of approximately \$2.067 billion (or a present value of \$1.836 billion discounting the second issue at 5.00%).

The estimated excess cash flow in the Public Option scenario ranges from \$349 million (at a discount rate of 8.75%) to \$728 million (at a discount rate of 6.50%). The aggregate benefit of the present value of bond issues and excess cash flow over the 50 year analysis period is therefore estimated at between \$2.185 billion (discounted at 8.75%) and \$2.564 billion (discounted at 6.50%).

The additional value achieved in this scenario is based on future operating decisions to implement certain cost savings initiatives and an ongoing commitment to realizing operations and maintenance efficiencies.

Alternative Three: Public-Private Option

The analysis of the Public-Private Option is based on the following assumptions and cost estimates.

Assumptions

- ODOT and OBM, acting pursuant to statute, will lease the Turnpike to a Concessionaire for a maximum 50-year term;
- The concession lease will grant the Concessionaire the right to collect and retain project revenues, including tolls, for the full term, in return for its up-front concession payment as well as its performance obligations to operate and maintain the Turnpike to ODOT standards, and its obligation to reinvest in the asset as required to meet long-term performance standards. It will also require the Concessionaire to hand back the Turnpike to the State at the end of the term in conditions pre-established in the agreement;
- Cash toll rates will increase annually at a level not greater than the change in CPI;
- ETC toll rates will increase to match cash toll levels within the initial five years, followed by annual increases capped at the change in CPI;
- ETC toll rates for Local Trips will be held constant for 10 years;
- The State will receive an upfront payment and a gross revenue share over the life of the contract; and
- All outstanding tax-exempt Turnpike bonds will be defeased and the requisite IRS penalty payment made.

Estimates and Model Inputs

- By reducing toll transaction costs and accelerating E-ZPass adoption, rationalizing service levels, and implementing operating efficiencies, a Concessionaire is estimated to spend less per year, in comparison to the Status Quo with Increased Bonding Capacity and the Public Option, to operate and maintain the Turnpike, excluding service plazas;
- Performance based requirements incorporated into the concession agreement would reflect ODOT standards; and

- The Concessionaire is estimated to spend approximately \$2.9 billion (2012 dollars) on capital improvement projects excluding service plazas, over a 50 year evaluation period. Estimated total capital costs for major pavement, bridge and other areas of investment are approximately 10 percent lower for the Public-Private Option than the other options due to private sector efficiencies in procurement, such as design-build contracting, and economies of scale in areas such as equipment and material purchasing.

Financial Results

The Public-Private Option assumes a 15% gross revenue share, ETC toll freeze for ten years for Local Trips, and non-local ETC equalization to cash toll rates by the end of the initial five year period. This scenario also assumes more aggressive ETC penetration (the rate at which ETC is adopted over cash collections) than either the Status Quo or Public Option.

Based on these assumptions, the Public-Private Option would yield an estimated gross upfront concession payment estimated at \$2.624 billion. Under the Public-Private Option, the Analysis assumes an approximately \$735 million defeasance escrow and an approximately \$65 million IRS penalty payment. These costs would be netted from the gross upfront concession payment. Therefore, the net up-front concession fee proceeds, after the cost of defeasance and penalty payment to the Internal Revenue Service ("IRS Penalty Payment") for receiving net proceeds over time as opposed to an upfront one-time payment, would equal a present value of approximately \$1.824 billion (2012 dollars). Note that the IRS Penalty Payment would be due if the concession payment is received over time, which would be the case under the gross revenue share scenario.

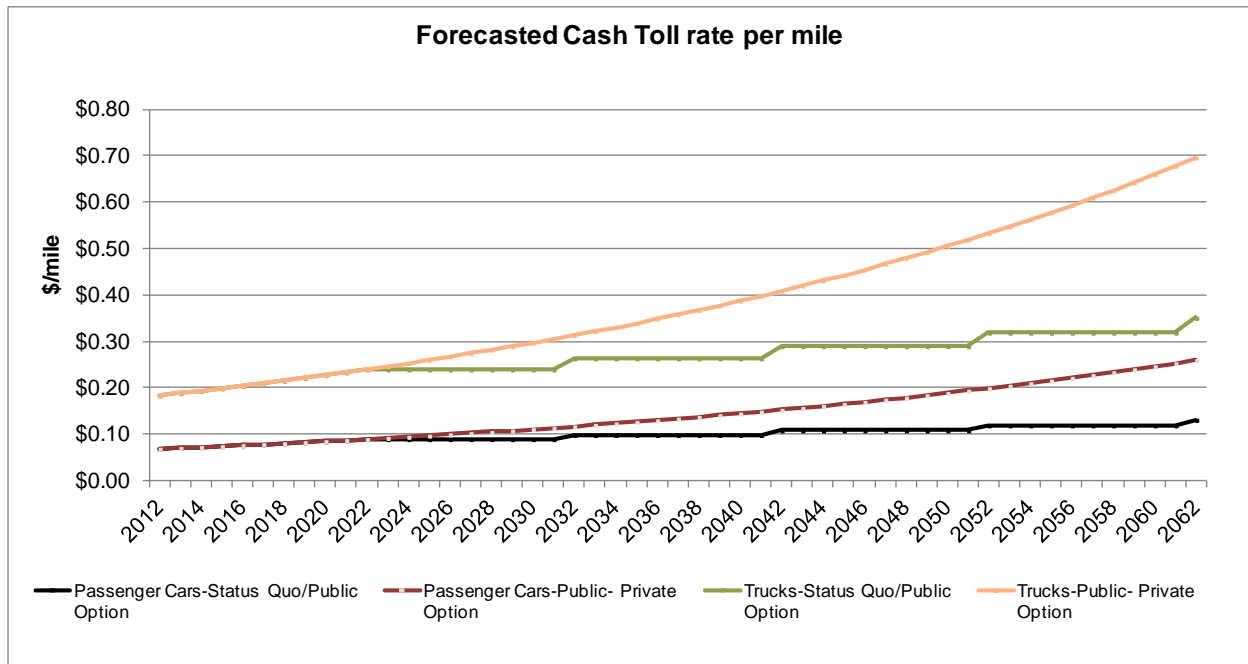
In addition to the concession fee, the State is estimated to receive between \$1.477 billion (discounted at 5.0%) and \$2.206 billion (discounted at 3.5%) of estimated present value gross revenue share receipts over the 50 year evaluation period, resulting in an estimated total net value to the State at between \$3.301 billion and \$4.030 billion over the full term.

Summary

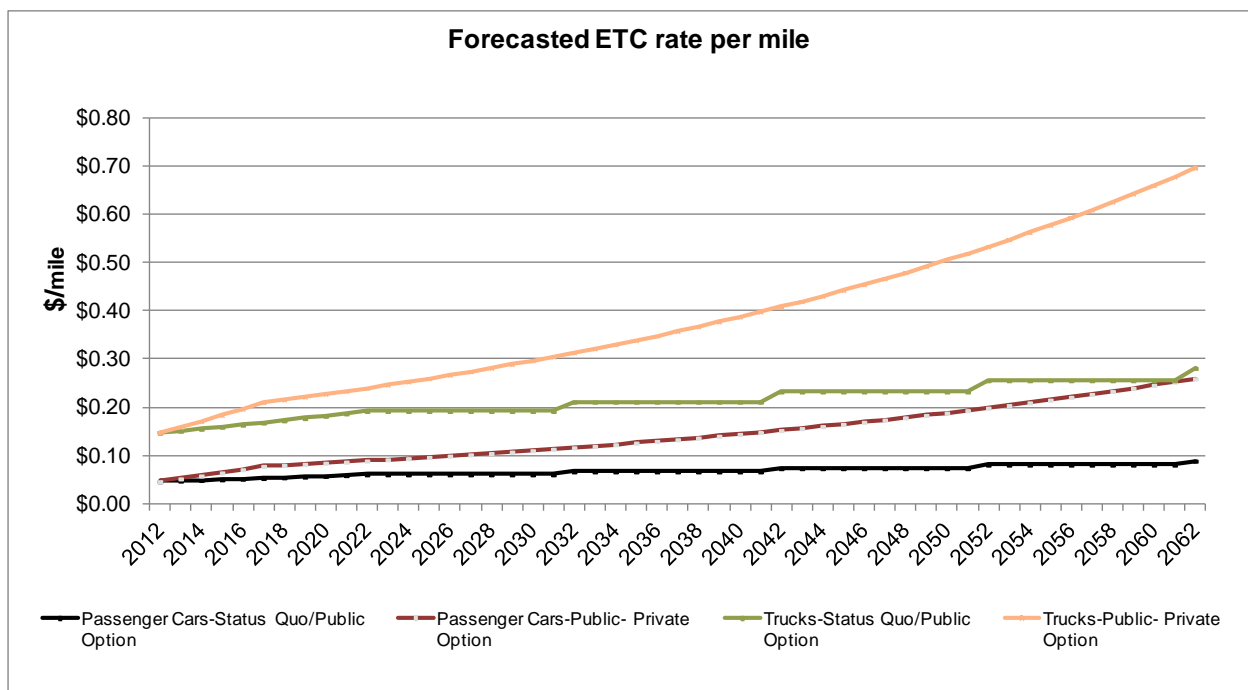
This report presents three options: the Status Quo with Increased Bonding Capacity, the Public Option, and the Public-Private Option. In addition to the quantitative assessments summarized above, each option reflects important "qualitative" and policy considerations that should also be considered. For example, an important aspect of the State's decision is the impact of tolling policies on future toll rates. Under the Status Quo with Increased Bonding Capacity and the Public Option, tolls are projected to increase at a slower rate than under the Public-Private option. For the purposes of analysis, the Status Quo with Increased Bonding Capacity and the Public Option assume that toll rates will increase annually based on the change in CPI for the first 10 years, followed by increases of 10% every 10 years thereafter. However, toll rate increases after the initial 10 year horizon will be based on policy decisions. Under the Public-Private Option, tolls are forecast to increase annually at a rate of CPI over the 50 year evaluation period. In the first two cases the State's actual, future toll policy may differ from that described above so long as its financial obligations are being met, while in the third scenario the Concessionaire's rights to increase tolls would be incorporated into a long-term concession agreement.

The graphs below illustrate the estimated differences in toll growth rates between the Status Quo with Increased Bonding Capacity / Public Option and the Public-Private Option, for passenger cars and commercial trucks.

Forecasted Cash Toll Rate per Mile:



Forecasted ETC Rate per Mile:



In addition to toll rates, the Analysis identifies a variety of other considerations relevant for each alternative. The considerations represent potential challenges and risks that the State should assess from a policy perspective as part of the decision-making process. The tables below outline select benefits and considerations identified for each option. Note that this summary is by no means all-inclusive, and

there are many additional considerations that should be reflected in the State's final decision; however the summary is intended to highlight a number of the more significant considerations under each approach.

Status Quo with Increased Bonding Capacity	
Benefits	Considerations
<ul style="list-style-type: none"> ■ The OTC maintains direct responsibility and control over the Turnpike, including toll rate setting, service level, and capital investment. ■ Current tax-exempt interest rates available in the municipal market are favorable relative to historical benchmarks. 	<ul style="list-style-type: none"> ■ The OTC retains comprehensive risks of maintaining, operating, and leveraging Turnpike. ■ The OTC is estimated to invest approximately \$3.3 billion (2012 dollars) in capital maintenance costs over the 50 year evaluation period. ■ The OTC would be required to consistently increase tolls to realize expected value. ■ Bond issues beyond the initial financing would be subject to various risks, including market risk, project performance risk, etc. ■ Increased debt burden results in reduced operating flexibility. ■ The potential exists for forced toll adjustments to maintain coverage ratios and meet capital investment needs.

Public Option	
Benefits	Considerations
<ul style="list-style-type: none"> ■ The OTC, in coordination with ODOT, maintains direct responsibility and control over the Turnpike, including toll rate setting, service level, and capital investment. ■ Current tax-exempt interest rates available in the municipal market are favorable relative to historical benchmarks. ■ Operating and maintenance efficiencies may be realized through alignment with ODOT standards and policies by eliminating redundancies, creating economies of scale, and other efficient practices. 	<ul style="list-style-type: none"> ■ The OTC retains the comprehensive risks of operating, maintaining, and leveraging the Turnpike. ■ The OTC is estimated to invest approximately \$3.3 billion (2012 dollars) in capital maintenance costs over the 50 year evaluation period. ■ The OTC would be required to consistently increase tolls to realize expected value. ■ Bond issues beyond the initial financing would be subject to various risks, including market risk, project performance risk, etc. ■ Increased debt burden results in reduced operating flexibility. ■ The potential exists for forced toll adjustments to maintain coverage ratios and meet capital investment needs. ■ Future excess cash flows may be impacted by a wide array of project and market risks.

Public-Private Option	
Benefits	Considerations
<ul style="list-style-type: none"> ■ Strong market interest currently exists for a potential Turnpike concession. ■ The State retains control through an enforceable concession contract. ■ The Concessionaire assumes comprehensive project performance risks. ■ The Concessionaire would be estimated to invest over \$2.9 billion (2012 dollars) in capital improvements. ■ The State benefits throughout the contract period from a 15% gross revenue share, paid prior to operations and maintenance costs. ■ The State is not directly responsible or at risk for the Concessionaire's financing. 	<ul style="list-style-type: none"> ■ The State is contractually bound for the full concession term, estimated to be 50 years. ■ The Concessionaire's objective is to maximize returns, which may run counter to certain stakeholder interests. ■ The State would incur an estimated \$234 million of defeasance escrow inefficiencies and related IRS penalties. ■ The Concessionaire would be authorized to impose annual toll rate increases limited to CPI.

It is important to note that multiple variations of each option considered in this report are possible, including different approaches to the assumed changes in operations, maintenance, capital improvements, tolling and other policies. Any variation may result in different efficiencies, operating and capital costs, net proceeds to the State, benefits and considerations relative to those documented in this report.

To achieve its stated goals and objectives, and the optimal result for the residents of Ohio, the State may select one of the options considered herein or it may select a different approach altogether, and the actual implementation of the State's chosen alternative for the Turnpike will influence the resulting cost savings and the ultimate value to the State. The intent of this Analysis is to provide an objective, comprehensive study to assist the State in making an informed decision regarding its future plans for the Ohio Turnpike.

Analysis Objectives and Purpose

Introduction

The Ohio Turnpike (“Turnpike”) is a critical transportation asset to the State of Ohio (“State”), particularly the northern part of the State along the Turnpike corridor. The corridor includes communities from western to eastern Ohio, ranging from Wauseon and Bryan to Youngstown and points in between such as Toledo, Sandusky, Elyria, Cleveland, and Akron. The Turnpike is a vital 241 mile route supporting job creation, commerce and economic activity in northern Ohio, across the Great Lakes, and the eastern half of the United States. For nearly 60 years, the Ohio Turnpike Commission (“OTC”) has maintained and operated the Turnpike independently and has been primarily supported by Turnpike toll revenue.

Like many roads of its age, the Turnpike requires significant capital investment. The total estimated of pavement reconstruction and other major capital improvements is approximately \$3.0 billion (in 2012 dollars) over the next 50 years. At the same time, the State of Ohio must address critical infrastructure and transportation needs throughout the state in a fiscally constrained environment.

The State through the Ohio Department of Transportation (“ODOT”) and the Ohio Office of Budget and Management (“OBM”) is actively engaged in addressing Ohio’s infrastructure and transportation needs. The Ohio Turnpike Opportunity Analysis (“Analysis”) was commissioned by the State to assess the options available to unlock the value in the Turnpike, while preserving its future viability and quality of service.

The scope of this Analysis is to conduct an assessment of the commercial, financial, strategic and technical current and future needs of the Turnpike. The Analysis is intended to provide information to the State about its options for unlocking the value of the Turnpike to increase the State’s infrastructure investment and promote economic competitiveness. KPMG Corporate Finance LLC acted as the lead strategic, commercial and financial advisor for the Analysis in collaboration with Parsons Brinckerhoff, an internationally recognized engineering firm as technical advisor, Fahlgren Mortine, a Columbus based communications firm, and the University of Toledo’s Intermodal Transportation Institute as a public policy advisor.

The Analysis was guided by the following overarching objective identified by the State: ***Be a good steward of Ohio infrastructure assets by unlocking value to grow Ohio’s economy and maximize job creation.***

The State also developed more detailed goals for the Analysis. These principles have been critical to shaping the direction of the Analysis and are described below:

- **Maintain Turnpike Ownership** – At all times maintain State ownership of the Turnpike;
- **Benefit Northern Ohio Communities** – Attempt to obtain the maximum benefit for the communities surrounding the Ohio Turnpike;
- **Fair and Predictable Toll Rates** – Remain cognizant of the financial burden imposed on Turnpike users, particularly local Ohio commuters and businesses;
- **Manage Diversion** – Limit truck diversion onto parallel routes;
- **Upfront Payment** – Generate immediate proceeds to invest in major new transportation projects over the next five years;

- **Revenue Share** – Generate a long-term revenue stream for future use; and
- **Promote Job Creation and Economic Growth** – Invest proceeds in infrastructure projects that generate jobs and economic development.

Ohio's Transportation Needs

National and State Challenges

Like the vast majority of states, Ohio's transportation budget is dependent on dwindling federal and state gas tax revenues. The current and future infrastructure needs of the State are greater than resources available. Federal funding for transportation is not anticipated to increase to help offset the shortfalls faced by Ohio and many other states. Nationwide, existing U.S. infrastructure will need considerable renewal and expansion to address decades of deferred maintenance and to meet forecasted demands.

ODOT's appropriated annual budget for fiscal year 2013 (July 1, 2012 to June 30, 2013) is \$2.9 billion, an increase of about 5% compared to fiscal year 2012.³ Federal and State funding sources each account for about 50% of total revenue sources projected for fiscal year 2013. Federal funding comes from the Highway Trust Fund, and State funding comes primarily from the Ohio motor vehicle fuel tax, which is projected to generate about \$1.7 billion per year, of which \$1.1 billion is distributed to ODOT.

While construction and materials costs increased dramatically over the past decade, the last federal gas tax increase occurred in 1993 and the gas tax is not indexed to inflation. Ohio's motor fuel tax was last increased in 2005 from 26 to 28 cents per gallon⁴.

Furthermore, the fuel efficiency standards for all vehicles have increased substantially during the same timeframe. To comply with fuel efficiency requirements, automakers will have to achieve an average fuel efficiency of 54.5 miles per gallon by 2025. The impact of gains in fuel efficiency on gas tax revenues was analyzed in a 2012 study conducted by the Congressional Budget Office. The study projects that gas tax revenue will drop at least \$57 billion by 2022 if fuel economy standards go into effect as planned.⁵ The funding gap will likely worsen as alternative fuel vehicles become more readily available.

The Moving Ahead for Progress in the 21st Century Act (MAP-21) legislation enacted into law by Congress in July 2012 maintains federal funding for surface transportation programs, but does not increase the gas tax or increase overall funding levels in a meaningful way. In fact, Congress was only able to sustain funding by making select accounting and policy decisions that may not be available in the future. However, MAP-21 does provide states with more opportunity for more innovative state-directed solutions by reducing the environmental hurdles to roadway expansion and tolling, and adding greater flexibility to existing tolling programs. MAP-21 also expands federal loan programs that have proven key to facilitating public private partnerships ("P3"), such as the Transportation Infrastructure Finance and Innovation Act ("TIFIA") which provides critical credit and loan enhancements to projects.⁶

According to the American Society of Civil Engineers ("ASCE"), Ohio has one of the largest roadway systems in the U.S. and the system is heavily utilized, causing significant deterioration of the roadway.⁷ The State's highway system is integral to maintaining economic activity and encouraging a business friendly climate to support Ohio's many industries, particularly manufacturing and agriculture, which rely

³ <http://www.lsc.state.oh.us/fiscal/transportation/transbudget129/budgetindetail-transportation-en-fy11actexp.pdf>

⁴ http://tax.ohio.gov/divisions/excise/motor_fuel/tax_rates.stm

⁵ "How Would Proposed Fuel Economy Standards Affect the Highway Trust Fund," *Congressional Budget Office*, May 2012.

⁶ <http://www.fhwa.dot.gov/map21/summaryinfo.cfm>

⁷ "2009 Ohio Infrastructure Report Card: Roads Fact Sheet Grade: D," *ASCE American Society of Civil Engineers*, May 2009.

on the system to move their goods throughout the Midwest. Yet, ASCE found that 43% of Ohio's roads achieved "critical", "poor", or "fair" condition status. The ASCE explains that roads designated as "fair" will likely require improvements in the near future, while those in "critical" condition require immediate attention and are unsafe. Based on this condition rating and the State's transportation funding shortfall, ASCE assigned Ohio's roads a "D" rating in their 2009 Ohio Infrastructure Report Card.

Transportation Review Advisory Council ("TRAC") Program

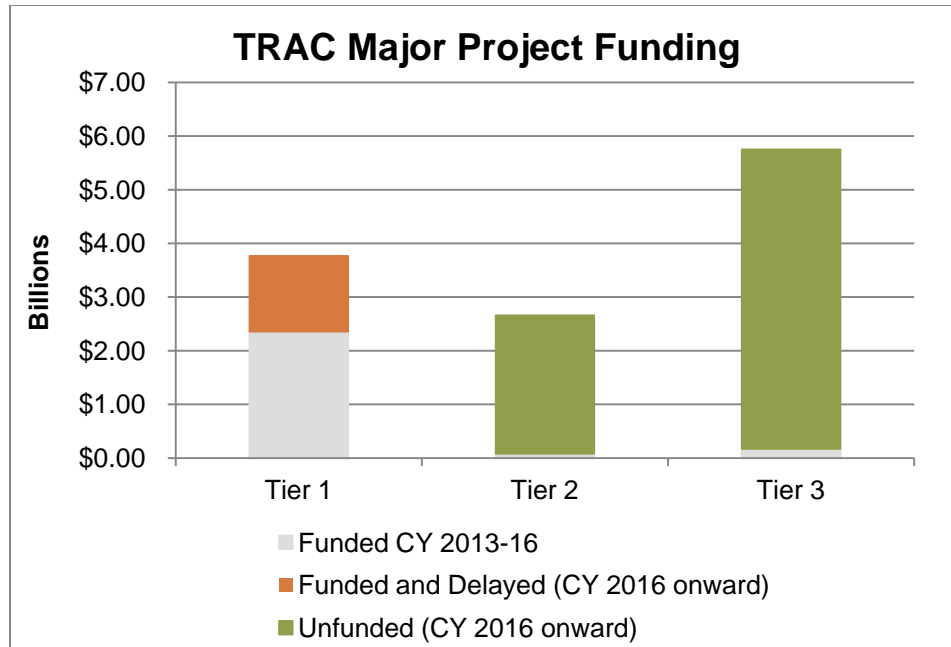
The TRAC was established in 1997 by the Ohio General Assembly for the purpose of developing and overseeing ODOT's project selection process for major new transportation projects in the State. Projects that fall under the responsibility of the TRAC belong to the "Major New Capacity program." These projects must increase transportation capacity and must be categorized as critical to the economic development and mobility needs of the people of Ohio.

The TRAC consists primarily of non-ODOT staff who are chosen to approve project selection and funding. TRAC is chaired by the Director of ODOT, and includes a total of eight other members, six of whom are chosen by the Governor, and two of whom are chosen by the Speaker of the Ohio House of Representatives and the President of the Ohio Senate. New funds available for construction are only made available to TRAC once the maintenance needs are met for the existing transportation assets maintained by ODOT.

To be considered by TRAC, major new projects must be evaluated on a scoring sheet, primarily split between transportation factors and community, economic growth and development factors. Transportation factors account for approximately 55% of the possible score available, based on factors such as traffic, benefit and cost, air quality, functional class, and intermodal connectivity. Community, economic growth and development factors include adopting appropriate land use measures, positioning land for redevelopment, economic impact, and economic distress. Another part of TRAC's mission in completing necessary transportation projects is to encourage local and private investment in the project.

A TRAC project must first be nominated by persons outside of the TRAC. The TRAC only selects projects and prioritizes them once nominated. After projects have been nominated, scored, and finally selected by TRAC, the projects are categorized in to three tiers: Tier 1 (highest priority), Tier 2 (under development), and Tier 3 (multiphase projects). Tier 1 projects are expected to be funded and constructed within a four year period to the extent funding is available, while Tier 2 projects do not have committed funding and are generally still under development. Tier 3 projects include multiphase projects with larger components that are still under development, but that also include phases in Tier 1 or Tier 2.⁸

⁸ TRAC Policy and Procedures, June 2, 2011.



As a result of the State's transportation funding shortfall, the TRAC has delayed \$1.4 billion of its Tier 1 construction commitments in the 2013-2016 Major New Program List published in 2012.⁹ Additionally, the "Tier 2" and "Tier 3" projects are underfunded by \$8.2 billion. Among the 21 projects in the 2013-2016 ODOT Major New Construction Program delayed up to 13 years from their original start dates were the following critical projects:

- Mahoning Road Transit Corridor;
- Phases 2-5 of Interstate-70/ Interstate-71 in Columbus;
- Cleveland Lakefront West;
- Columbus North Outerbelt; and
- Interstate-75 through Hamilton County.

Tier 2 projects are only partially funded up to \$83 million into CY2014, and the total additional funding needed for these projects is \$2.67 billion. Tier 3 projects are only partially funded into CY2014 up to \$172 million, and the total amount additional funding needed to complete these projects is \$5.68 billion.

ODOT has identified cost savings and revenue opportunities to reduce and eliminate delays in planned project construction. Between January and June 2012, ODOT identified \$400 million in savings to help offset the TRAC project funding shortfall recognized in January¹⁰. While the significant shortfalls described above remain, these cost savings helped to prevent further future delays. ODOT achieved savings from workforce reductions through attrition, vehicle fleet reductions, higher than projected gas tax receipts, savings from a mild winter, and the elimination of federal earmarks. The \$200 million in savings applied to the fiscal year 2013 capital budget included:

⁹ 2013-2016 TRAC Major New Program List, <http://www.dot.state.oh.us/trac/Pages/ProjectListSummary.aspx>.

¹⁰ <http://www.dot.state.oh.us/news/Pages/InnovationEfficiencyFreesUp400Million.aspx>.

- \$20 million not used by ODOT's district offices in 2012;
- \$90 million in workforce reductions and cost savings as a result of improved agency efficiency (\$40 million in savings carried over from fiscal year 2012 and \$50 million saved in 2013); and
- \$90 million in higher than projected gas tax receipts and the elimination of federal earmarks.

Division of Innovative Delivery

As a result of the gap between transportation funding and needs, ODOT continues to look for innovative solutions to save money, generate revenue, accelerate project delivery, and reduce the cost of doing business. ODOT officially launched the Division of Innovative Delivery (the "Division") in March 2012 to explore ways to unlock value in the Ohio Turnpike and other assets, in addition to pursuing a range of innovative methods to identify funding for transportation projects, including:

- Unlocking the revenue potential of the Ohio Turnpike;
- Improving agency efficiency and cutting costs;
- Converting certain non-interstate rest areas to service plazas operated on a concession basis;
- Selling advertising and sponsorship rights at interstate rest areas;
- Seeking sponsorship and naming rights of certain state-owned assets; and
- Exploring P3s that could expedite the construction of certain projects.

Since the passage of House Bill 114, ODOT has been exploring the use of P3s as a means to deliver public projects. House Bill 114, signed into law in March 2011 by Governor John Kasich, allows ODOT to contract with private entities to develop, build, finance, operate, and/or maintain public assets.¹¹ The Division was tasked with evaluating several of the State's projects, along with the Ohio Turnpike, to determine whether a P3 or alternative delivery method would provide the best value for money. ODOT is currently exploring alternative delivery methods for projects such as the Second Innerbelt Bridge in Cleveland, the Brent Spence Bridge in Cincinnati, and the Portsmouth Bypass, due to the lack of traditional funding available to move these projects forward.

Unlocking the Value of the Turnpike

To accelerate critical projects in the TRAC program, ODOT is evaluating a wide range of options for the delivery of its projects. Seeking new solutions such as unlocking the potential of the Turnpike is a key part of ODOT's approach to the State's transportation funding shortfall. The Ohio Turnpike Analysis will assist in determining whether opportunities exist to leverage the Turnpike to generate additional revenues, while maintaining the integrity of the Turnpike and its operations.

¹¹ Ohio Turnpike website, http://www.ohioturnpike.org/about/commission_members/.

About the Ohio Turnpike

The Ohio Turnpike is a 241-mile toll road that provides east-west access for travel through northern Ohio. The OTC, a body corporate and politic created by the Ohio Turnpike Act of 1949, manages and operates the Turnpike. The OTC is authorized to construct, maintain, repair, and operate the Turnpike and to issue Turnpike Revenue Bonds, payable solely from Turnpike system pledged revenues. Ground was broken for the Ohio Turnpike in 1952 and, the Turnpike opened to the traveling public in 1955. The average annual daily traffic (AADT) is approximately 22,300 cars and 9,300 trucks.^{12 13}

The Turnpike is maintained by self-generated income and receives no federal funding. About one percent of the Turnpike's funding comes from Ohio tax dollars, because the Turnpike receives five cents per gallon from Ohio motor fuel tax revenue fuel sold on the Turnpike. The Turnpike is incorporated into the U.S. Interstate Highway System and assigned route numbers I-80/90 and I-76. However, since no federal funds were used in the construction or operation of the Turnpike, the Federal Highway Administration has no direct oversight of OTC.

The OTC has nine members, including five voting members and four non-voting members. Four voting members are appointed by the Governor with the advice and consent of the Senate, and no more than two of these may be members of the same political party. Appointed members serve an eight-year term. Terms are staggered so that one starts or ends every two years. The fifth voting member is the Director of the Ohio Department of Transportation, who is a member ex-officio.

Two of the non-voting members, the Director of Development and the Director of Office of Budget and Management, also have ex-officio status. The two remaining non-voting members are a State senator and a State representative. They are named, respectively, by the President of the Senate and the Speaker of the House of Representatives.

Financials

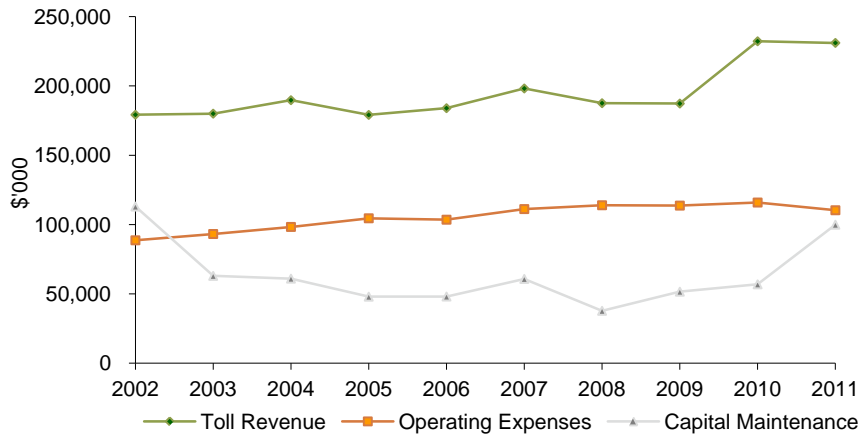
Turnpike traffic and revenue have steadily increased over the last ten years. Revenues grew from \$194 million in fiscal year 2002 to \$251 million in fiscal year 2011. For the year ended December 31, 2011, earnings before interest, tax, depreciation, and amortization ("EBITDA") was approximately \$144 million. From 2002 to 2011, tolled traffic remained stable around 50 million vehicles annually, with an approximate 80:20 split between passenger cars and commercial vehicles.

The most recent toll increase took effect on January 1, 2012, and the new rates maintained an E-ZPass discount that incentivizes customers to use E-ZPass by allowing them to pay a lower toll than customers using cash or a credit card to pay their toll. The OTC began accepting E-ZPass electronic payments at its tolling plazas in October 2009. With the acceptance of E-ZPass, the tolling schedule changed from an eleven-class system based on vehicle weight to a seven-class system based on number of axles and the height of the first two axles. Below is an illustration of toll revenue, operating expenses, and capital maintenance costs incurred by the OTC over the past ten years per the Ohio Turnpike Comprehensive Annual Financial Reports 2002-2011. Operating expenses include administration and insurance, maintenance of roadway and structures, service and toll operations, and traffic control and safety.

¹² AADT represents average daily traffic across the full length of the Turnpike (241 miles).

¹³ AADT data provided by Mike Wawszkiewicz, ODOT on May 21, 2012.

Historical Financial Snapshot 2002-2011



The total amount of Turnpike Revenue Bonds outstanding as of October 2012 was approximately \$566 million.¹⁴ The most recent issuance was the Revenue Refunding Bonds 2010 Series A issue of \$132 million. The currently outstanding bond issues (with their original issuance amounts) are summarized below:

- Turnpike Revenue Refunding Bonds, 1998 Series A (\$298,575,000);
- Turnpike Revenue Refunding Bonds, 2001 Series B (\$93,550,000);
- Turnpike Revenue Refunding Bonds, 2009 Series A (\$137,205,000); and
- Turnpike Revenue Refunding Bonds, 2010 Series A (\$131,290,000).

Fitch and Standard & Poor's have rated the outstanding OTC debt as AA/AA, effective as of October 19, 2012 and October 25, 2010, respectively.¹⁵

Tolling

Toll revenue is used to meet the OTC's revenue requirement including operating expenses and debt service. If toll revenue is insufficient to meet the revenue requirement in any given fiscal year, OTC is required by Ohio Revised Code 5537.13 (C)(1) and the Master Trust Agreement to increase tolls to cover 100% of the fiscal year's revenue requirement. The OTC's 20-year long range projections assume toll increases of 10% in 2022 and 2032.¹⁶

In January 2012, the OTC increased the toll rate by approximately 10% for all users traveling the entire distance of the Turnpike. Prior to this, the toll rate was increased during the implementation of E-ZPass in

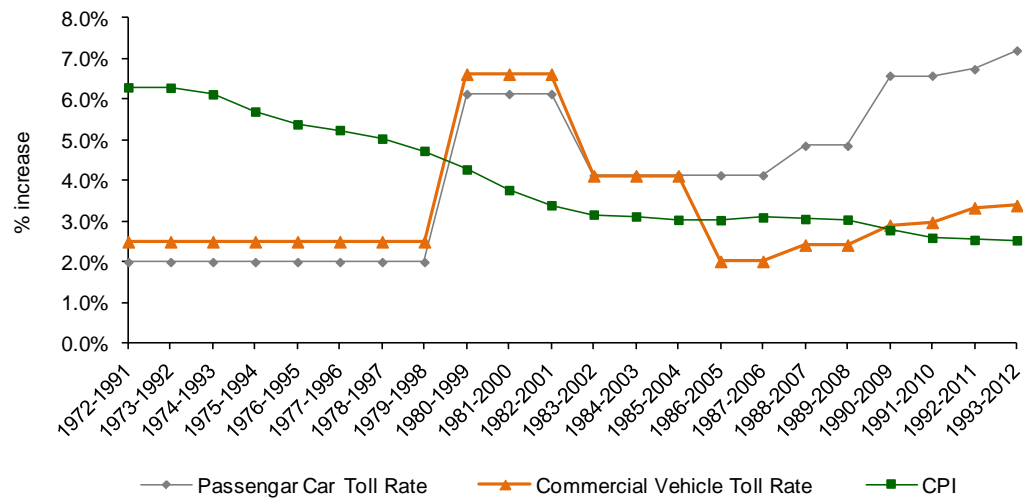
¹⁴ Official Statements of currently outstanding OTC bonds: Turnpike Revenue Refunding Bonds, 1998 Series A (\$298,575,000); Turnpike Revenue Refunding Bonds, 2001 Series B (\$93,550,000); Turnpike Revenue Refunding Bonds, 2009 Series A (\$137,205,000); Turnpike Revenue Refunding Bonds, 2010 Series A (\$131,290,000).

¹⁵ Electronic Municipal Market Access, EMMA, <http://emma.msrb.org/SecurityView/SecurityDetailsRatings.aspx?cusip=A3CCB382E1691AD1ADE7A21E745874114>.

¹⁶ ODOT Division of Finance: Turnpike Questions, October 2011.

October 2009. During 1993-2012, the rolling twenty-year average increase in toll rate per mile was 7.2% for passenger cars and 3.4% for commercial trucks, respectively. The increase in toll rates outpaced the average annual growth of CPI, which was 2.5% over the same time period.

Rolling 20-Year Average Toll Increases

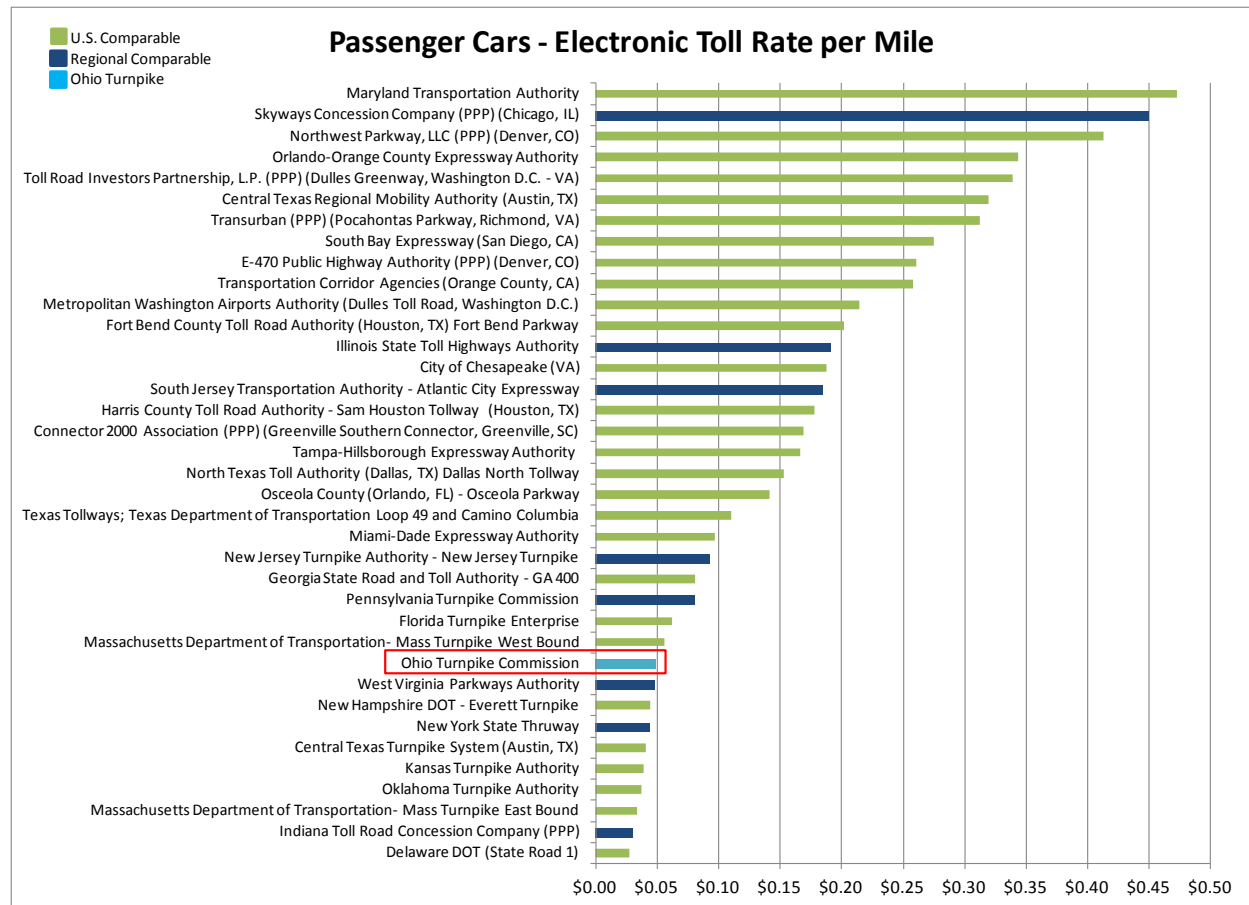


The Turnpike's current toll rate per mile for each category is approximated as follows:

- Passenger Cars- Cash: \$0.07/mile;
- Passenger Cars – Electronic: \$0.05/mile;
- Commercial Vehicles (Class 5) – Cash: \$0.18/mile; and
- Commercial Vehicles (Class 5) – Electronic: \$0.15/mile.

In comparison to other tolling facilities throughout the United States, the Turnpike's toll rates per mile are generally lower. Regionally, the Turnpike's rates are among the lowest. Below is a comparison of the Turnpike's toll rate per mile for passenger vehicles' electronic and cash toll rate per mile and commercial vehicles' electronic and cash toll rate per mile against other tolling facilities.

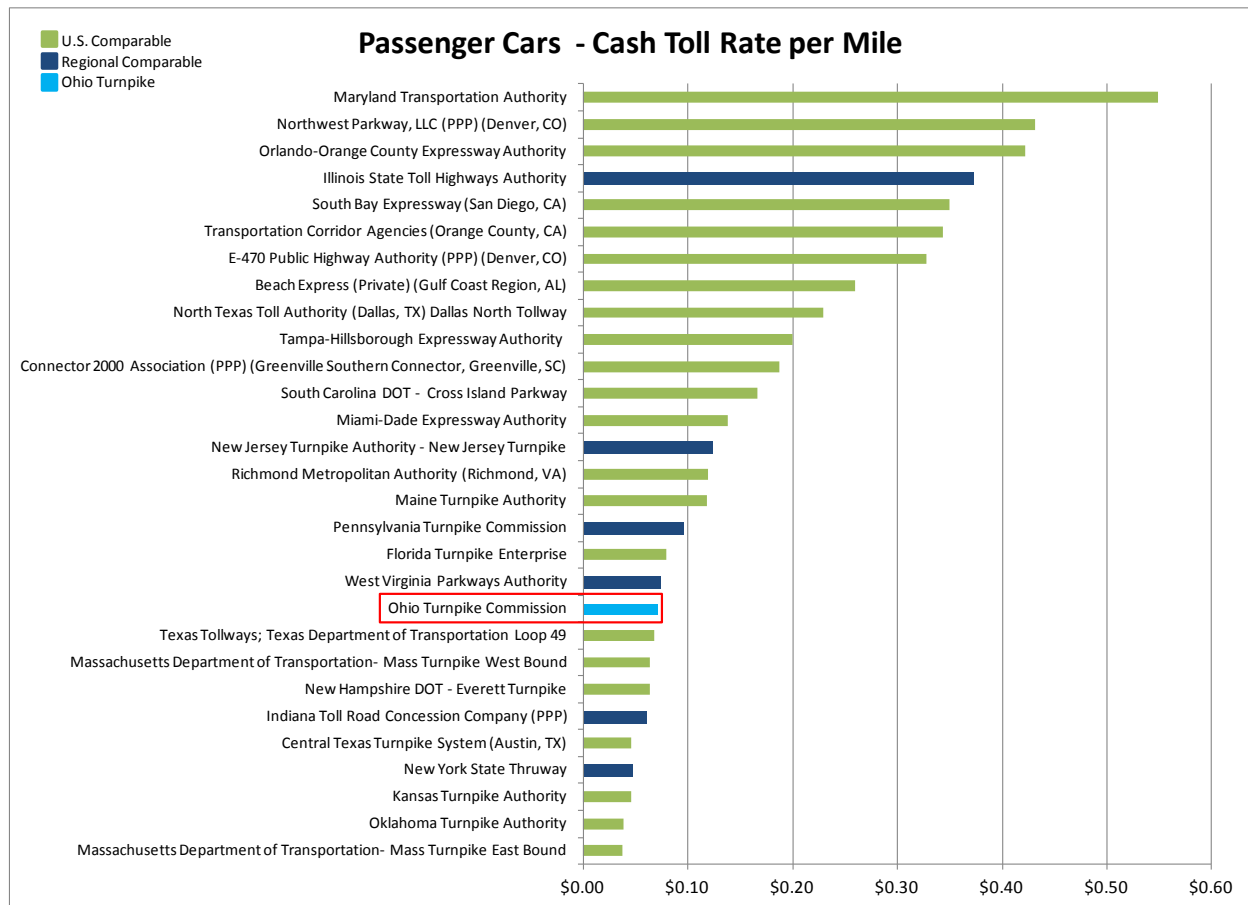
Comparison of Electronic Toll Rates per Mile for Passenger Cars – U.S. and Regional Toll Roads



Comparison of Electronic Toll Rates per Mile for Passenger Cars – Regional Toll Roads Only

Turnpike Regional Comparison – Passenger Cars Electronic	
Facility	Toll Rate per Mile
Indiana Toll Road Concession Company	\$0.030
New York State Thruway	\$0.044
West Virginia Parkways Authority	\$0.047
Ohio Turnpike Commission	\$0.047
Pennsylvania Turnpike Commission	\$0.080
New Jersey Turnpike Authority – New Jersey Turnpike	\$0.092
South Jersey Transportation Authority – Atlantic City Expressway	\$0.184
Illinois State Toll Highways Authority	\$0.191
Skyways Concession Company	\$0.449

Comparison of Cash Toll Rates per Mile for Passenger Cars – U.S. and Regional Toll Roads

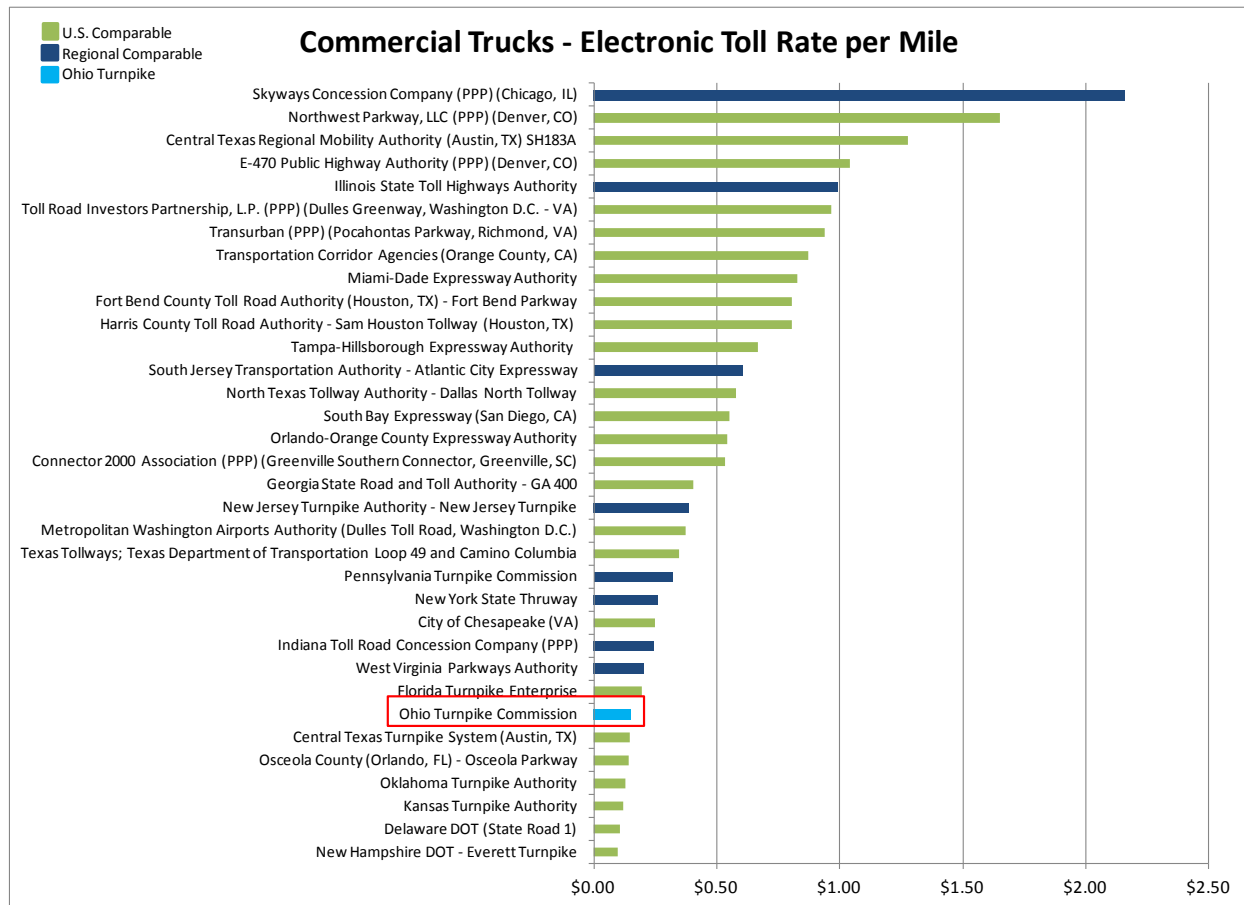


Comparison of Cash Toll Rates per Mile for Passenger Cars – Regional Toll Roads Only ¹⁷

Turnpike Regional Comparison – Passenger Cars Cash	
Facility	Toll Rate per Mile
New York State Thruway	\$0.046
Indiana Toll Road Concession Company	\$0.060
Ohio Turnpike Commission	\$0.068
West Virginia Parkways Authority	\$0.073
Pennsylvania Turnpike Commission	\$0.095
New Jersey Turnpike Authority – New Jersey Turnpike	\$0.123
Illinois State Toll Highways Authority	\$0.372

¹⁷ Cash rate unavailable for Skyways Concession Company and South Jersey Transportation Authority.

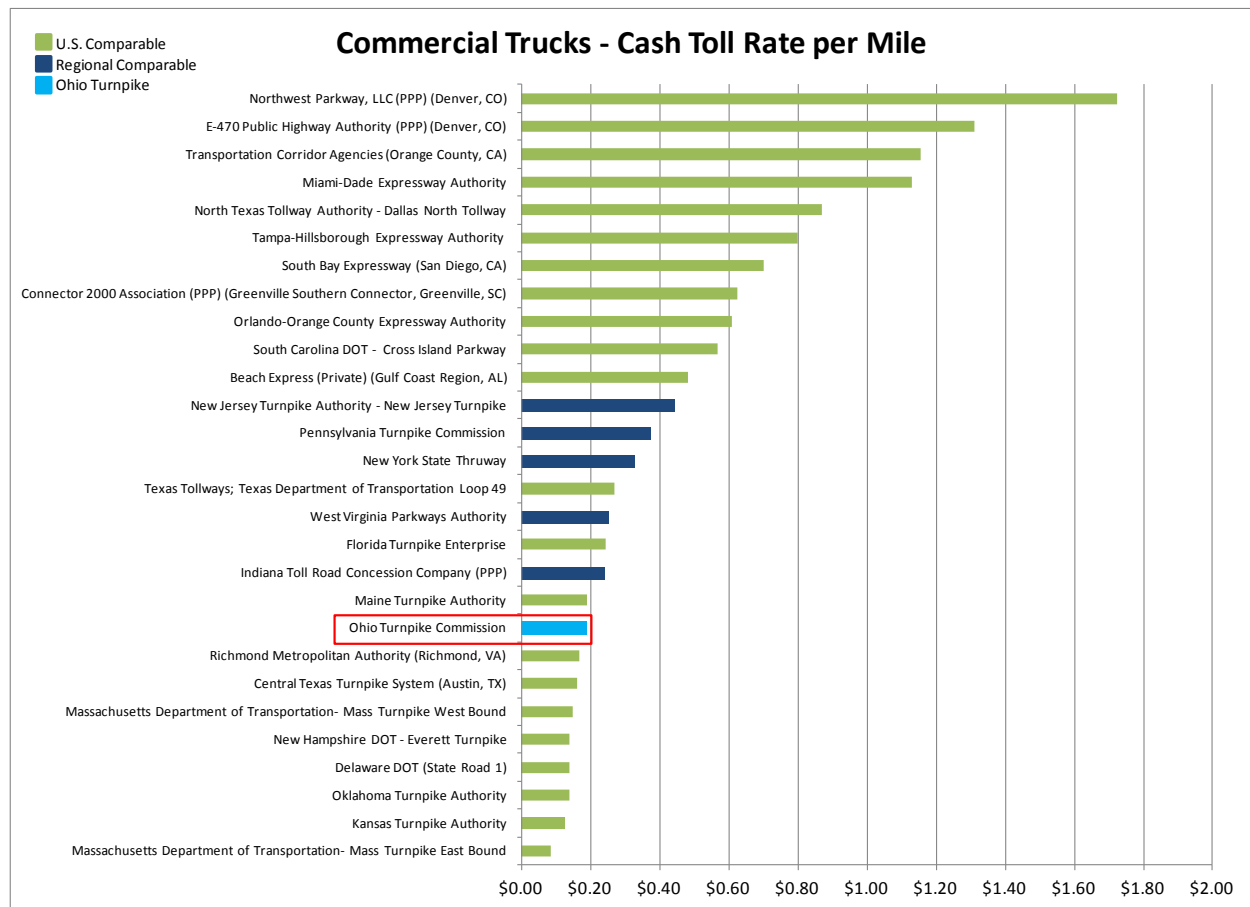
Comparison of Electronic Toll Rates per Mile for Commercial Trucks – U.S. and Regional Toll Roads



Comparison of Electronic Toll Rates per Mile for Commercial Trucks – Regional Toll Roads Only

Turnpike Regional Comparison – Commercial Vehicles Electronic	
Facility	Toll Rate per Mile
Ohio Turnpike Commission	\$0.145
West Virginia Parkways Authority	\$0.199
Indiana Toll Road Concession Company	\$0.239
New York State Thruway	\$0.258
Pennsylvania Turnpike Commission	\$0.316
New Jersey Turnpike Authority – New Jersey Turnpike	\$0.382
South Jersey Transportation Authority – Atlantic City Expressway	\$0.599
Illinois State Toll Highways Authority	\$0.986
Skyways Concession Company	\$2.154

Comparison of Cash Toll Rates per Mile for Commercial Trucks – U.S. and Regional Toll Roads



Comparison of Cash Toll Rates per Mile for Commercial Trucks – Regional Toll Roads Only ¹⁸

Turnpike Regional Comparison – Commercial Vehicles Cash	
Facility	Toll Rate per Mile
Ohio Turnpike Commission	\$0.183
West Virginia Parkways Authority	\$0.238
Indiana Toll Road Concession Company	\$0.248
New York State Thruway	\$0.323
Pennsylvania Turnpike Commission	\$0.372
New Jersey Turnpike Authority – New Jersey Turnpike	\$0.440

¹⁸ Cash rate unavailable for Skyways Concession Company and South Jersey Transportation Authority.

Capital Maintenance

The OTC's capital expenditures largely support three major initiatives: service plaza reconstruction, base concrete replacement, and third lane improvement. Total capital expenditures in 2011 were \$99.9 million, and the Turnpike is projected to spend \$98.3 million on capital projects in 2013.

Service Plazas

The Turnpike has a total of 16 service plazas, configured in pairs at eight separate interchanges that average approximately 30 miles apart over the length of the road. The OTC began replacing the original service plazas, which were built in the 1950s, beginning in 1998. As of the date of this analysis, 12 of the original service plazas had been replaced and the remaining four were closed for reconstruction.

Base Concrete Replacement

In 2011, the OTC started the task of replacing the original concrete base under the Turnpike with a 5.3 mile section through Sandusky County. The base concrete has not been replaced since the Turnpike's initial construction. The current schedule anticipates replacing 16 sections of concrete during the first ten years, and then reassessing the condition of the remaining original concrete before continuing.

Third Lane Improvement

The OTC began the third lane capital improvement in 1996; thus far, 151 of 160 centerline miles have been completed. The remaining lane miles and bridge work are included in the Turnpike's long-term capital improvement plan.

Key Facts about Ohio Turnpike and other Ohio Interstates

ODOT maintains Interstate highways, other U.S. highway routes and state highways across Ohio. Interstates 70, 71 and 75 in Ohio are of similar length and also share other relevant factors that contribute to the cost of operating and maintaining a roadway that allows for a comparison. The table below provides the data regarding each of the highways.

Route	Length of Road (miles)	Number of Lane Miles (Length x # of Lanes)	Number of Bridges	Number of Interchanges	Number of Stream Crossings	Number of RR Crossings	Number of Counties Passed Through	Number of Service Plazas/ Rest Areas
Ohio Turnpike	241	1374	563	31	65	54	13	16
I-70	226	1063	391	76	56	54	10	10
I-71	246	1329	497	76	52	50	15	12
I-75	211	1047	463	107	56	65	11	10
ODOT Interstate (Combined)	1332	6774	2887	563	315	378	43	47
ODOT (All Roads)	19355	49251	13918	1080	4063	4721	88	122

ODOT and Turnpike Traffic Characteristics

While the Turnpike has a higher percentage of truck traffic than many ODOT roadways, the table below highlights that the total number of trucks on comparable ODOT Interstates is higher. Greater truck traffic and higher vehicle weights generally result in more expensive per lane mile maintenance costs.

Route	Average of Average Daily Traffic (Cars)	Average of Average Daily Traffic (Trucks)
Ohio Turnpike	22,300	9,300
70	34,059	14,070
71	49,126	11,483
75	49,664	14,523
ODOT Interstate (Combined)	48,203	10,497

ODOT and Turnpike Pavement Conditions

The pavement of the Turnpike and the ODOT Interstate system is, in general, in good condition. However, the Pavement Condition Ratings on the Comparable ODOT Interstates and on the ODOT Interstate system exceed those on the Turnpike (higher ratings represent better pavement condition).

Route	Average Pavement Condition Rating
Ohio Turnpike	80
70	88
71	87
75	89
ODOT Interstate (Combined)	87

ODOT and Turnpike Bridges

The number of bridges in the entire ODOT system far exceeds the number of bridges on the Turnpike. In general, ODOT maintains more bridges per employee than the Turnpike, although average bridge condition is comparable.

Bridges							
	# of Bridges	Bridges per Employee	Bridge Deck Area (Sq. Ft.)	Deck Wearing Rating (Low is Good)	Deck Floor Rating (Low is Good)	General Appraisal Rating (High is Good)	Paint Rating (High is Good)
Ohio Turnpike	563	0.56	4,872,030	1.2	1.27	6.7	6.4
ODOT – Interstates	2887	0.52	42,312,906	1.5	1.63	6.7	6.9
ODOT – All Roads	13918	2.53	109,197,272	1.5	1.57	6.7	6.7

ODOT and Turnpike Maintenance Comparison

On average, ODOT maintains its Interstates for 62% of the Turnpike's costs. See table below.

Maintenance Costs		
	Maintenance Cost	Maintenance Cost per Lane Mile
ODOT Interstate	\$89,000,000	\$13,138
Ohio Turnpike	\$29,000,000	\$21,100

Overview of Options

The Analysis addresses three options that seek to achieve the goals for the Turnpike identified by the State. The first is the status quo with modifications to OTC's bonding program ("Status Quo with Increased Bonding Capacity," or "Status Quo"). The second is a public option ("Public Option"), which assumes the Turnpike would be more closely aligned with the State's Department of Transportation. The third is a long-term public-private partnership option ("Public-Private Option"), which reflects a Turnpike lease to a private concessionaire ("Concessionaire") for a period of 50 years. The following provides an overview of the respective options.

Status Quo with Increased Bonding Capacity

Overview

Under the Status Quo with Increased Bonding Capacity, the Analysis assumes that the governance and operations and maintenance of the OTC will remain relatively unchanged, while the way the OTC finances projects will be revised to enable the OTC to take advantage of future revenue growth. Currently, the OTC is not permitted to leverage forecast incremental revenues, due to its Additional Bonds Test which constrains bonding capacity based on the previous year's net available revenues. By closing the current lien and issuing future debt pursuant to a new Master Trust Indenture with bond covenants tied to forecast revenues, the OTC will expand its borrowing capacity.

Governance and Oversight

As mentioned previously, the Status Quo with Increased Bonding Capacity assumes that the OTC retains governance and oversight of the Turnpike.

Key Considerations

In evaluating the Status Quo with Increased Bonding Capacity Option, key considerations include:

- Can the OTC restructure its borrowing program, and revise its Master Trust Indenture, to protect existing bondholders while significantly increase bonding capacity?
- Will the OTC make the critical toll adjustments necessary to realize the full value of the Turnpike? Historically, many public agencies have subsidized tolls with adjustments lower than the rate of inflation, and/or lower than demand would dictate, due to the policy or political challenges of raising tolls on a regular basis.
- How will debt levels impact OTC's ability to ensure that capital costs are covered and operations and maintenance needs are addressed?
- How does the OTC ensure the amount of debt issued is supportable at targeted rating levels?
- Will the current favorable municipal bond markets continue throughout execution of the program? In the case of subsequent bond issues, how will changes in market conditions affect the plan?

Public Option

Overview

Under the Public Option, the Analysis assumes the OTC would be more closely aligned with ODOT. The Turnpike would be maintained to the same standards that ODOT upholds for Ohio's interstate system,

and the OTC would continue to be responsible for financing any capital expenditures needed to maintain the Turnpike, as well as leveraging future cash flows to enable funding of critical highway projects.

By more closely aligning management of the Turnpike with the other roadways or highways under ODOT's purview, potential savings could be achieved through avoidance of duplicative processes and streamlining of operations. In the Public Option, the Analysis assumes that many of these potential savings are realized through OTC's collaborative relationship with ODOT regarding the Turnpike's operations and maintenance, as well as capital maintenance.

With regard to capital structure, the existing Turnpike Revenue Bonds would not be affected; rather, similar to the Status Quo with Increased Bonding Capacity, the OTC would issue new bonds secured by forecast Turnpike revenues to generate additional funding for highway projects. Bond proceeds could be used to maintain the Turnpike in a state of good repair as well as to support other highway projects.

Governance and Oversight

Under the Public Option, the Analysis assumes that responsibility for operations and maintenance of the Turnpike would be closely aligned with ODOT statewide operations and maintenance program. The OTC would continue to retain responsibility for issuing Turnpike debt. The Analysis assumes that OTC and ODOT would implement efficiencies to improve operations of the Turnpike.

Key Considerations

In evaluating the Public Option, key considerations include:

- Can the OTC and ODOT achieve operations and maintenance cost efficiencies? What opportunities exist to eliminate redundancies and create economies of scale?
- Will the OTC and ODOT make the critical toll adjustments necessary to realize the full value of the Turnpike? As with the Status Quo with Increased Bonding Capacity, a risk is that toll adjustments may not be made as required to achieve the results summarized in this report.
- How will debt levels impact the OTC and ODOT's ability to ensure that capital costs are covered and operations and maintenance needs are addressed?
- How does the OTC ensure the amount of debt issued is supportable at targeted rating levels?
- How favorable will market conditions be for municipal bond offerings? In the case of subsequent bond issues, how will changes in market conditions affect the plan?
- How will the comprehensive risks of Turnpike operations and maintenance be allocated?
- Will future excess cash flows be realized? While the potential value of unencumbered cash flows is significant, the certainty of those cash flows needs to be assessed.

Public-Private Option

Overview

The Public-Private Option is assumed to be effected through a concession lease with a private party to operate and maintain the Turnpike for a period of 50 years. Importantly, in this option the State would still retain full ownership of the Turnpike.

As contrasted with the Public Option, under the Public-Private Option, the State would be required to “defease” (the process of the borrower setting aside the cash necessary to pay off the debt service on the outstanding bonds) any outstanding tax-exempt debt of the OTC. Under this structure the State could receive an upfront payment, or a combination of upfront payment and a revenue share over the life of the contract. Pursuant to the concession lease the Concessionaire would be responsible for operating and maintaining the Turnpike to predetermined standards. This contractual obligation would ensure that stakeholders, including Turnpike travelers, would enjoy predictable, high-quality service at performance levels pre-established by ODOT.

In addition to operations and maintenance responsibilities, the Concessionaire would be obligated to reinvest certain cash flows back into Turnpike facilities in order to maintain the asset in quality condition. Such long-term asset condition standards would be established for elements such as sub-base and base pavement, bridges, culverts and structures, service facilities, etc. Additionally, the concession contract would specify certain hand-back requirements to be achieved by the Concessionaire prior to turnover to the State at the end of the concession term. Such requirements would assure the State of receiving the full value of the long-term contract by having the asset returned in a specific condition.

Governance

Under the Public-Private Option, the Analysis assumes the State would enter into an agreement with a private party to operate and maintain the Turnpike for a period of 50 years. Key policy decisions on toll rates and discounts, performance standards and levels of service would be determined prior to executing the agreement and would be included in the concession contract. Pursuant to statute, ODOT would establish and retain enforcement rights over the Concessionaire to ensure long-term performance.

Key Considerations

In evaluating the Public-Private Option, key considerations include:

- Will the Concessionaire operate the Turnpike effectively? The Turnpike is an economic engine for northern Ohio and a critical link among cities, towns and villages. Obligations such as snow clearance are paramount to an efficient transportation system, and assurance of long-term performance of such responsibilities would be critical to success of this option.
- Will the Concessionaire make the necessary future capital investments in the Turnpike? Estimates indicate that the Turnpike would require approximately \$3 billion of capital investment over the next 50 years. The existing pavement is nearing the end of its useful life and the full 241 miles must be replaced during the duration of this analysis period. Additionally, many bridge structures will need to be replaced over the next 50 years.
- Can innovation in operations and maintenance be achieved? Can the private sector address the Turnpike's capital needs through technology improvements such as innovative pavement design and/or all-electronic "open-road" tolling?
- Can private sector operations enhance value?
- Will key stakeholders be adequately protected? Managing future toll increases while limiting traffic diversion is critically important to the residents of northern Ohio as well as Turnpike users. Can the private sector effectively meet these comprehensive goals?
- What is the financial liability to the State if the Concessionaire becomes insolvent or bankrupt?
- Can comprehensive risks be cost-effectively transferred to the Concessionaire?
- How can the State benefit from the ongoing success of the Turnpike through a long-term revenue share arrangement?

Stakeholder Outreach and Market Sounding

Approach to Stakeholder Engagement

Stakeholders in northern Ohio and throughout the State are interested in the Ohio Turnpike and the discussion of any potential change to the Turnpike will understandably attract attention from many groups and individuals. Throughout the analysis, the State and its advisory team engaged in stakeholder outreach through a variety of forums and audiences. The objectives of stakeholder engagement include:

- Provide information on the current state of transportation funding in Ohio;
- Outline the measures and activities ODOT is implementing to address the funding crisis;
- Establish personal communication lines with stakeholders;
- Educate stakeholders on the scope of the analysis and potential outcomes;
- Listen to concerns and answer questions regarding the analysis and the future of the Turnpike; and
- Clarify any misinformation or miscommunication related to the Analysis.

The following describes the major outreach activities.

In-Depth Interviews

A key tool to communicate with stakeholders has been “in-depth interviews,” or informal, small group forums with local civic and business leaders. The aim of in-depth interviews is to encourage a full discussion of the Analysis and allow participants to raise questions and concerns directly to the Analysis team and State representatives. The open discussion of participant issues regarding the Analysis and the future of the Turnpike is paramount. Twelve in-depth interviews were held in the Ohio Turnpike corridor.

In-Depth Interview Locations

In-depth interviews were held in the following locations:

- Fremont (Sandusky County) – February 24, 2012
- Perrysburg (Wood County) – February 24, 2012
- Youngstown (Mahoning County) – March 23, 2012
- Ravenna (Portage County) – March 23, 2012
- Akron (Summit County) – April 13, 2012
- Canton (Stark County) – April 13, 2012
- Bryan (Williams County) – April 26, 2012
- Waueson (Fulton County) – April 26, 2012
- Sandusky (Erie County) – May 11, 2012

- Elmore (Ottawa and Sandusky Counties) – May 11, 2012
- Elyria (Lorain County) – May 16, 2012
- Brecksville (Cuyahoga County) – May 16, 2012

The in-depth interviews provided feedback which helped to inform the State’s objectives and the potential commercial and governance structure of each option. Participants generally expressed support for the Analysis process and shared concerns about the future of Turnpike, as summarized in the table below.

In-Depth Interviews: Key Takeaways and Common Themes
<ul style="list-style-type: none"> ■ Acknowledged need to find money for local projects ■ Noted that the region’s economy is highly reliant on transportation ■ Recognized the potential operational inefficiencies of the Turnpike, citing snow plows deployed hours before actual snow fall ■ Supported maintaining the quality of service of the Turnpike ■ Interested in operational changes if quality of service can be maintained ■ Focused on need for road maintenance and replacement to keep arteries to the region operational ■ Supported the savings and ease of the E-ZPass system and the potential for discounts for Local Trips ■ Troubled by transportation funding crisis ■ Concerned about distribution of proceeds from a Turnpike transaction ■ Concerned that tolls will increase and trucks will divert to rural roads ■ Interested in stimulating economic growth and promoting local communities

Public Outreach

Public Meetings and Forums

ODOT and the advisory team have also met with Metropolitan Planning Organizations (MPOs) and other key stakeholders in small groups and participated in local events, including meetings with the following groups:

- Northeast Ohio Area-wide Coordinating Agency (NOACA) – June 10, 2011
- Akron Metropolitan Area Transportation Study (AMATS) – October 21, 2011
- Eastgate Regional Council of Governments – April 30, 2012
- Toledo Metropolitan Area Council of Governments (TMACOG) – March 30, 2012
- Lorain County Board of Commissioners – May 23, 2012
- American Council of Engineering Companies (ACEC) – January 19, 2012
- Ohio Contractors Association (OCA) – August 13, 2012
- Ohio Trucking Association (OTA) – August 13, 2012
- Transportation Advocacy Group of Northwest Ohio (TAGNO) – September 21, 2012

Project Website

To provide additional background information a website was developed to provide facts and data regarding the Turnpike and the scope of the analysis. The website is available at www.ohturnpikeanalysis.com.

Market Soundings

Market soundings were conducted to better inform the analysis of the three options. The firms that participated represent both the public finance industry as well as the infrastructure/P3 market. The objective of the market sounding was to solicit feedback from the industry, including understanding respective views on each option, the potential terms of each option, and the key considerations that should be evaluated and/or implemented as part of either option.

The market sounding participants from the private sector included:

Infrastructure Investors	Infrastructure Developers and Operators	Municipal Finance Groups
InfraRed Capital Partners (US) LLC	Abertis Infraestructuras, S.A.	Citigroup, Inc.
Goldman Sachs Infrastructure Partners	ACS Infrastructure Development, Inc. / Dragados USA, Inc.	RBC Capital Markets
JP Morgan Asset Management	Cintra Infraestructuras, S.A.	Bank of America Merrill Lynch
QIC Global Infrastructure	Vinci S.A.	

Infrastructure Investors	Infrastructure Developers and Operators	Municipal Finance Groups
Macquarie Capital		
Morgan Stanley Infrastructure		

Summary of Market Feedback

In order to help preserve unfettered feedback and honest dialogue, the market sounding participants were assured that specific statements would be held in confidence; however, the participants were notified that a summary of the common themes would be documented in this report. The perspectives below represent general views and should be reviewed with the understanding that a range of views were expressed.

Status Quo with Increased Bonding Capacity and Public Option

The discussion pertaining to the Status Quo with Increased Bonding Capacity and the Public Option centered on various tax-exempt bonding structures the State could potentially use to unlock the Turnpike's value. Following are select ideas provided by participants:

Alternative	Detail
Public Equity	The State might access the tax-exempt debt markets and still attract additional capital through a public pension fund acting as a "quasi" equity investor. The key is that the public pension fund must be classified as a governmental unit. Given expected returns, the suggestion was that this option works best if the pension fund can avoid defeasance of the existing Turnpike debt while retaining access to the tax exempt debt markets. Both a public pension fund and the State would need to be incentivized to negotiate such a structure, since a competitively procured solution is likely not possible.
Long Dated Zero Coupon Bonds	This alternative includes issuance of long dated zero-coupon bonds with an early redemption feature to allow for accelerated amortization tied to available excess cash flows. This structure would allow the State to effectively securitize a portion of the Project's residual cash flows. These bonds would likely incur a yield premium relative to other tax exempt debt.

Public-Private Option

Following are select ideas provided by participants with respect to the Public-Private Option:

Topic	Response
Deal Structure	A term 50 years was the general consensus regarding operating the Turnpike in a private concession contract scenario, with feedback indicating that 45 years is potentially acceptable and some preference that a term longer than 50 years is desirable to help ensure returns are preserved in light of unforeseen events.
Procurement Structure and Timeline	General preference for a two-phase procurement process with a Request for Qualifications followed by a Request for Proposals. One to two months should be allocated to the RFQ posting, response and shortlist, and six months for the

Topic	Response
	subsequent RFP process. Following the selection of the preferred bidder, a timeframe of three to four months to achieve financial close is preferred.
Revenue Share	A transaction with a revenue share arrangement could be possible and would provide the State with a substantial ongoing share of proceeds throughout the contract term (preference for a range of 10-15% gross revenue share).
Legislation	Participants expressed general understanding and identified no relevant issues at this time with ORC sections 5501.70 to 5501.83 relating to the Public-Private Option. Several participants indicated legal counsel would need to further study if the Public-Private Option is selected.
Service Plazas	Participants indicated a preference to include service plazas as part of the concession for the Public-Private Option, since the service plazas provide opportunities for enhanced customer service.
Managing Diversion	A number of innovative approaches could be explored to manage diversion, such as potential fuel credit programs, enforcement of weight restrictions and speed limit management on parallel routes.
Toll Regime	The market understood the State's desire to limit toll increases to a maximum of CPI on an annual basis and indicated this could be acceptable. Furthermore, participants emphasized that toll increases linked to an annual indexation, such as CPI, is critical to the returns expected from third party financial investors, particularly public pension and insurance funds that invest in P3s.
Tolling Operations	Overall, efficiencies in tolling through a private concession contract are expected based on the Turnpike's profitability, policies of neighboring states, and public acceptance of tolling. Participants noted there is significant potential value to be gained from implementing video tolling, although appropriate enforcement legislation would need to be enacted to maximize value.
Return on Investment	Participants provided feedback that private equity would require after-tax returns in the range of 11%. Conveyance of responsibility for non-toll revenues would likely result in a higher required return on investment.
Communication to the Market	Participants expressed a strong preference for the State to communicate a reserve price to demonstrate its commitment and expectations. Additionally, participants stressed the importance of clear communicating of expectations, since they would incur significant technical and financial costs in developing bids and pursuing the transaction.

The above is certainly not an all-inclusive list of issues and market feedback, but is representative of two days of very constructive conversations. In general, the market sounding exercise was informative in developing the Options Analysis and reflecting reasonable revenue, cost and commercial expectations.

Technical Assessment

Parsons Brinckerhoff (“PB”), a global engineering and construction management firm, served as the technical advisor for the Analysis. PB was responsible for conducting a technical evaluation of the Turnpike asset to evaluate the historical performance, physical condition and current operations of the Turnpike. PB developed forecasts for operations, maintenance, capital, and lifecycle costs for each of the options under review. In addition, PB developed traffic and revenue forecasts for each of the options under review, and analyzed potential diversion to assess the impact of scenarios considered on diversion of traffic onto parallel routes.

For the technical assessment, separate technical assumptions were developed for the Status Quo with Increased Bonding Capacity, Public Option and the Public-Private Option. The Status Quo with Increased Bonding Capacity assumed that the Turnpike maintenance and operations standards would remain relatively unchanged. The Public Option assessed whether ODOT operating practices and streamlining certain services could be applied to achieve cost savings over current Turnpike practices. The Public-Private assumed the operating practices of a Concessionaire, based on comparable operating agreements in other states.

Traffic and Revenue Forecast

Traffic Forecast

The Ohio Turnpike traffic and revenue forecasts were created using a two-stage modeling procedure. The Ohio Statewide Travel Demand Model (“Statewide Model”) was run to generate a baseline estimate of the total growth in auto and truck traffic on the Ohio Turnpike between 2010 and 2040, in five-year increments. These traffic forecasts assume that future tolls are held constant in real dollars. Further runs were then undertaken using a variety of toll growth scenarios to develop diversion curves as described below.

These volumes and diversion coefficients were input into a “rapid response” model (“Revenue Model”) to adjust forecasts for different scenarios such as changes in toll rates, Electronic Toll Collection (“ETC”) market penetration, and other factors. The Revenue Model accounts for the traffic diversion that results from changing the toll rates relative to their current real value using diversion coefficients. The table below documents the pertinent inputs to the Ohio Turnpike traffic forecast:

Input	Modeling Assumption
Model Area	Internal passenger travel in Ohio, plus a 50 mile halo. Freight flows for all of US and Canada.
Network	Roadway network in Ohio includes all Interstate, U.S., and State highways, as well as locally-owned arterial roads. Outside of Ohio, the network includes all US interstate highways and equivalent-level highways in Canada. The roadway network includes all planned capacity improvements in the Ohio DOT Transportation Plan.
Model Time Period	Annual (based on OTC Fiscal Year as specified in their Comprehensive Annual Financial Reports).
Model Years	Statewide Travel Demand Model for 2010, 2015, 2020, 2025, 2030, 2035, and 2040.

Input	Modeling Assumption
	Spreadsheet revenue model interpolates to annual values and extrapolates forecast from 2040 to 2063.
Number of Vehicle Classes	Forecasts for all seven classes of vehicles as defined by the OTC.
Population Growth	Taken from 2005 Ohio Department of Development estimates. From 2010 to 2040 values reflect approximately 0.25% annual population growth and 0.4% annual household growth (the difference reflects a declining average household size due to an aging population). These values are used by the statewide model to predict travel within Ohio.
Employment Growth	2010 IGI economic forecast for Ohio. From 2010 to 2040, values reflect approximately 0.5% annual employment growth. These values are used by the statewide model to predict travel within Ohio.
Growth in Commodity Flows	Forecasts from FHWA's Freight Analysis Framework, version 3. Values reflect approximately 1.2% annual growth in commodity flows. These commodity flows are used by the statewide model to forecast the growth in truck traffic throughout North America.
Growth in Auto Through Trips	Uses historic growth rate observed at state line crossings. Approximately 1.0% annual growth rate.
Base Year Traffic Volume	Observed volumes from traffic density data provided by the OTC, through the first three months of 2012; first three months of 2012 traffic growth percentage was used to forecast the last three quarters of 2012.
Base Year Toll Revenue	Based on observed toll revenue of 2011 and the first three months of 2012 (OTC data)
Base Year Tolls	Based on 2012 OTC toll policies. Separate rates for cash payment versus E-ZPass, allocated to segments based on length of the segment. Accounts for the impact of the approximate 10% toll increase (nominal terms) that occurred in January 2012.
Posted Speed Limit	70 miles per hour (mph) speed limit (effective April 1, 2011) on Ohio Turnpike; posted speed limits for the model network (e.g., 65 mph for urban freeways; 65 mph or 55 mph for urban freeways).
Electronic Toll Collection Penetration Rate	Public Option uses penetration rates forecast in Turnpike bond documents. Public-Private Option considers more rapid adoption of E-ZPass. See separate section on ETC market penetration.
Consumer Price Index Growth	Based on KPMG analysis for Midwest US: 2.7 percent per annum.
Violation Rate	0.5% cash violation rate; 1.5% ETC violation rate.
Value of Time	Value of time is used by the diversion curves to predict the response to toll changes. The value of times were calibrated during the backcast validation in order to replicate the observed responses to past toll changes. The values of time used are: <ul style="list-style-type: none"> ■ Class 1: \$22/hour

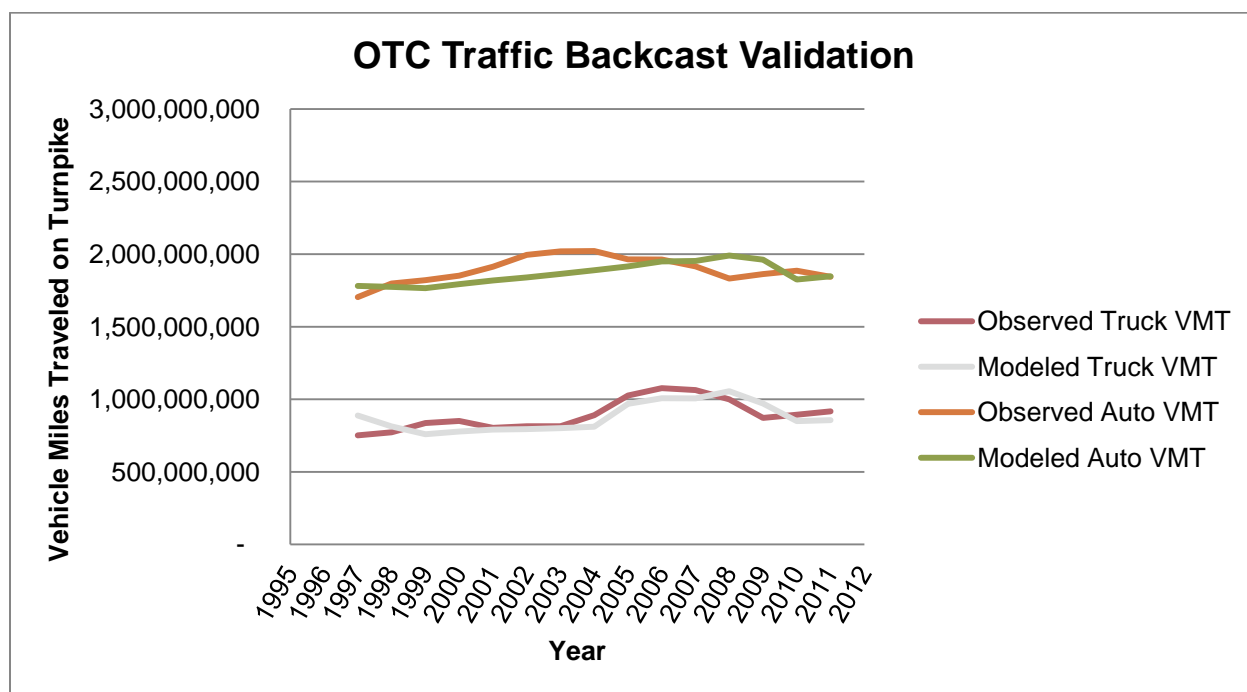
Input	Modeling Assumption
	<ul style="list-style-type: none"> ■ Class 2: \$25/hour ■ Class 3: \$30/hour ■ Class 4: \$35/hour ■ Class 5: \$40/hour ■ Class 6: \$45/hour ■ Class 7: \$50/hour <p>These values fall within the range of those reported in the literature.</p>

Backcast Validation

As a validation exercise, the Statewide Model and the Revenue Model were used to “backcast” (predict historical figures) OTC traffic levels between 1997 and 2011. Backcast results were compared to actual Turnpike truck and automobile volume to verify the model accuracy. The backcast period from 1997 to 2012 had a number of policy changes which affected travel demand, as summarized in the table below:

Year	Policy Change
1998	Truck toll increase
1999	Truck toll increase
2004	Truck speed limit increases from 55 to 65 mph on September 1, 2004
2005	Commercial tolls reduced 2% to 57% depending on vehicle classification
2010	E-ZPass introduced in October 2009. Toll increase for non-E-ZPass users. Change from weight-classes to axle classes.
2011	Speed limit increases to 70 mph on April 1, 2011
2012	Toll rate increase on January 1, 2012

Backcast results of vehicle miles traveled (VMT) on the Turnpike are presented in the graph below:



The models are able to reproduce the observed auto VMT with a 4.5% root mean squared (“RMS”) error and it is able to reproduce the observed truck VMT with a 7.5% RMS error.

Sensitivity Analysis and Public-Private Option Traffic Forecast

Sensitivity analyses were performed to 1) determine the magnitude of impact of key inputs in the traffic forecasting model, and 2) determine a likely more optimistic or “aggressive” traffic growth assumption for the concession scenario – the aggressive traffic growth assumption reflects the higher risk appetite of bidders who compete for the rights to a concession.

There are seven traffic “markets” profiled in the Statewide Model, and their forecasts are driven by growth forecasts for population, employment, the economy and freight forecasts, with adjustments based on model validation and backcast procedures. For automobiles, the markets are: short distance trips; long distance trips; visitor trips; and through trips. For trucks, the markets are short distance trips; long distance trips; and through trips.

The sensitivity tests measure the change in auto and truck vehicle miles traveled (“VMT”) on the Turnpike that results from changes to the model inputs. In each of these tests, the input growth rate was either halved or doubled, with results forecast for the year 2025. Since the growth is only a fraction of the total traffic, the percent change in total VMT ends up being rather modest for each of the individual tests. The tests are all one-dimensional, and include the following:

- 0.5X and 2.0X employment growth in Ohio and surrounding counties;
- 0.5X and 2.0X household growth in Ohio and surrounding counties;
- 0.5X and 2.0X growth in auto through trips on the Turnpike; and
- 0.5X and 2.0X growth in commodity flows to/from locations outside Ohio (which drive the long-haul trucks).

The results show that in 2025, these changes increase or decrease the auto VMT and truck VMT on the Turnpike by a few percentage points. The model is most sensitive to the growth in external commodity flows, where doubling the growth rate would increase the truck VMT by 8% in 2025 and halving it would reduce the truck VMT by 4% in 2025. This is tied to national trends in freight forecasting, and has little to do with the Ohio economy.

The sensitivity tests provided validation for the more optimistic traffic growth rate assumptions in the Public-Private Option, based on the following adjustments:

- For the 37.0% of Turnpike traffic market of short and long distance resident travel, the key driver of traffic growth is the growth in households in the model area. For the standard growth scenario, the 0.4% annual household growth is consistent with the projection provided by the Ohio Department of Development. An alternative growth rate of 0.92% annual household growth was assumed for this market. This rate is the Ohio Statewide Model 2010-2030 annual household growth rate that was used prior to adjustments for the recent recession.
- For the 11.2% of Turnpike traffic market of locally based short and long distance truck trips, the key driver is employment growth in the model area. The baseline employment growth rate is 0.51% annually, based on a 2010 IGI economic forecast for Ohio. An alternative growth rate of 0.72% annual employment growth was assumed. This is the Ohio Statewide Model 2010-2030 annual household growth rate prior to adjustments for the recent recession.
- For the 22.0% of Turnpike traffic market of national through truck trips, the commodity flows in the national economy are the key drivers. The base forecasts assume 1.2% annual growth in commodity flows, consistent with the FHWA Freight Analysis Framework ("FAF") 3 growth rates for selected commodities as they are incorporated in the Statewide Model. A review was made of several sources, including the FAF3 data, the older and more aggressive FAF2 data, and preliminary trip results from the Ohio Freight Plan. Based on this review, an assumption was made to use an alternative growth rate of 2.2% annual growth on commodity flows, consistent with the more aggressive forecasts.
- For the 9.9% of Turnpike trips by visitors, 3% growth rate in trips was assumed to be sufficiently high, and was not adjusted.
- For the remaining 19.8% of Turnpike traffic market of through trips by non-residents, the growth is driven by national population and economic growth, not by occurrences in Ohio. The base growth rate of 1.01% annually is based on the historic traffic growth at state line crossing. For this market, an alternative growth rate of 1.79% was adopted based on the ratio by which the through truck movements were adjusted (2.2%/1.2%).

The end result of these more aggressive growth assumptions is a higher rate of growth for VMT on the Turnpike. The annual traffic growth rate for 2010 – 2040 is presented in the table below for the Status Quo with Increased Bonding Capacity and the Public Option analysis and the more optimistic Public-Private Option. In the Public-Private Option, the VMT growth increases from 1.0% to 1.54% for autos and from 1.2% to 2.05% for trucks.

	2010-2040 Turnpike VMT Growth Rate		2040 – 2063 Turnpike VMT Growth Rate	
	Status Quo/ Public Option	Public-Private Option	Status Quo/ Public Option	Public-Private Option
Automobile	1.0%	1.54%	Extrapolated from 2010-2040 rate	Extrapolated from 2010- 2040 rate
Truck	1.2%	2.05%	Extrapolated from 2010-2040 rate	Extrapolated from 2010- 2040 rate

Toll Revenue Analysis

The traffic forecasts were input to a model to forecast toll revenue under different policy assumptions. A total of 17 toll policy cases were analyzed for the Status Quo with Increased Bonding Capacity, the Public Option and the Public-Private Option. The table below describes the variables and their application to the Status Quo with Increased Bonding Capacity, the Public Option and the Public-Private Option toll revenue cases that emerged as the two alternatives presented in this report.

Policy Variable	Status Quo/Public Option	Public-Private Option
Cash Toll Policy	Cash toll rates grow at increase in CPI (2.7%) for 10 years; then increase 10% every 10 years	Cash toll rates grow at increase in CPI (2.7%) for 50 years
E-ZPass Toll Policy and E-ZPass Toll Rate Equalization to Cash	<ul style="list-style-type: none"> ■ E-ZPass toll rates grow at increase in CPI (2.7%) for 10 years; then increase 10% every 10 years ■ No equalization to cash toll rates 	<ul style="list-style-type: none"> ■ E-ZPass rates increase to match cash rates for all vehicle classes, from 2013 to 2017 ■ After 2017, E-ZPass toll rates grow at increase in CPI (2.7%) for 50 years
E-ZPass Freeze for Local Automobile Trips using ETC	<ul style="list-style-type: none"> ■ Freeze E-ZPass tolls for Local Trips for 10 years ■ After 10 years, E-ZPass tolls for Local Trips revert back to the standard ETC rates (non-discounted rates) and then these rates continue to increase in accordance with toll policy above (i.e., tolls are increased 10% every 10 years). 	<ul style="list-style-type: none"> ■ Freeze E-ZPass tolls for Local Trips for 10 years ■ In years 11 – 15, E-ZPass tolls for Local Trips revert back to the standard ETC rates (non-discounted rates) and then these rates continue to increase in accordance with toll policy above (i.e., annual increase in CPI)
E-ZPass Market	E-ZPass market penetration based	Assumes more aggressive promotion of

Policy Variable	Status Quo/Public Option	Public-Private Option
Penetration	on OTC forecast	and hence use of E-ZPass over the concession term
Value of Time for E-ZPass Users	E-ZPass users' value of time is the same as cash users	E-ZPass users' value of time is 10 percent higher than cash users

Definition of Policy Variables in the Toll Revenue Analyses

Further definition of the variables in the toll revenue analyses is provided below.

Cash Toll Policy

Toll policies reflect policymakers' goals and it was assumed that the growth in the cash toll rate would be capped by the requirements of the concession contract in the Public-Private Option or by a formally adopted toll policy in the Status Quo with Increased Bonding Capacity and the Public Option. This analysis assumes that growth in cash toll rates will be capped at the rate of growth of the CPI which means that the toll rates will keep pace with inflation.

For the Status Quo with Increased Bonding Capacity and the Public Option, it was assumed that tolls would grow at CPI for the first 10 years, and thereafter at 10% every 10 years. In the Status Quo with Increased Bonding Capacity and the Public Option, there is no requirement on future administrations to maintain toll policies except in the earlier years in which debt is outstanding and when bond ratio covenants can force toll increases. After 10 years, tolls are assumed to grow at 10% every 10 years. This reflects the assumption in the OTC's 20-year long range projections that toll increases of 10% will occur in 2022 and 2032¹⁹.

The Public-Private Option assumes a constant CPI growth rate of 2.7%, over the 50 year concession term and this rate is used to calculate the revenue in nominal dollars in the financial model.

E-ZPass Toll Rate Equalization to Cash

There is currently a differential between the toll rate for cash paying customers and the toll rate for E-ZPass customers. The OTC established a higher toll rate for cash customers in order to encourage E-ZPass use. The discount for automobile drivers using E-ZPass is currently 32% and the discount for trucks is 20%.

The toll rate differential has been effective in encouraging E-ZPass use for trucks, but E-ZPass accounts for only about 30% of automobile transactions.

¹⁹ ODOT Division of Finance: Turnpike Questions, October 2011.

A higher ETC market penetration rate, such as in the Public-Private Option, would potentially result in an erosion of toll revenue due to the significant differential between cash and E-ZPass toll rates. Scenarios were analyzed wherein the ETC toll rates were equalized with the cash toll rate level over the first five years. This assumption is designed to counteract erosion of the average toll rate with increased E-ZPass market penetration rates. The table below shows this forecast toll change.

	Current Rate/mi.		2013	2014	2015	2016	2017
	<i>Cash</i>	<i>ETC</i>	<i>Phased Increase in ETC Rate/mi.</i>				
Class 1	\$0.069	\$0.047	\$0.051	\$0.055	\$0.060	\$0.064	\$0.069
Class 2	0.117	0.083	0.090	0.097	0.103	0.110	0.117
Class 3	0.139	0.104	0.111	0.118	0.125	0.132	0.139
Class 4	0.160	0.125	0.132	0.139	0.146	0.153	0.160
Class 5	0.183	0.147	0.154	0.162	0.169	0.176	0.183
Class 6	0.252	0.208	0.217	0.226	0.234	0.243	0.252
Class 7	0.344	0.297	0.307	0.316	0.325	0.335	0.344

E-ZPass Freeze for Local Automobile Trips

The Status Quo with Increased Bonding Capacity, the Public Option and the Public-Private Option included a 10 year freeze on E-ZPass trips for “Local Trips” for policy reasons. For the Status Quo with Increased Bonding Capacity and the Public Option, local E-ZPass tolls are assumed to revert to the 10% after 10 years approach at the end of the freeze period. In the Public-Private Option, local rates have a five year “catch up” period to converge with the other toll rates.

E-ZPass Market Penetration

ETC penetration rates impact revenue and operating costs. ETC penetration rates impact revenue due to the differential between cash and E-ZPass toll rates; operating costs are impacted due to the lower per transaction cost of E-ZPass toll collection. The OTC published ETC penetration rate forecasts in its bond offering documents. The forecast was provided through 2035, and from 2036 through 2062 the OTC forecast was extrapolated on a straight line basis. This forecast was used as a base case ETC penetration for the Status Quo with Increased Bonding Capacity and the Public Option, as shown the table below.

Electronic Toll Penetration Rate - Status Quo with Increased Bonding Capacity and the Public Option

Vehicle Class	2012	2013	2014	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2062
Class 1	30%	32%	34%	35%	40%	40%	40%	41%	41%	42%	42%	42%	43%	43%
Class 2	45%	45%	46%	47%	52%	57%	62%	67%	72%	77%	82%	87%	90%	90%
Class 3	44%	47%	51%	54%	66%	90%	90%	90%	90%	90%	90%	90%	90%	90%
Class 4	61%	64%	66%	69%	78%	95%	95%	95%	95%	95%	95%	95%	95%	95%

Vehicle Class	2012	2013	2014	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2062
Class 5	74%	77%	81%	85%	94%	94%	94%	94%	94%	94%	94%	94%	94%	94%
Class 6	91%	92%	93%	94%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%
Class 7	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%

Various initiatives can be used to accelerate ETC adoption and gain the benefit of lower operating costs. To model this, an accelerated ETC penetration scenario was developed. Higher market penetration rates were forecast over the period to reflect (1) private-sector operator practices and (2) the likelihood that toll technology will have greater acceptance over the forecast period. A summary of the toll penetration rate for the Public-Private Option is shown in the table below.

Electronic Toll Penetration Rate - Public-Private Option

Vehicle Class	2012	2013	2014	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2062
Class 1	30%	32%	35%	38%	60%	65%	70%	75%	80%	80%	85%	85%	90%	90%
Class 2	45%	45%	46%	47%	60%	65%	70%	75%	80%	80%	85%	85%	90%	90%
Class 3	44%	50%	53%	57%	75%	90%	92%	95%	95%	95%	95%	95%	95%	95%
Class 4	61%	65%	68%	71%	89%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Class 5	74%	77%	81%	85%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Class 6	91%	92%	93%	94%	97%	97%	97%	97%	97%	97%	97%	97%	97%	97%
Class 7	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%

Value of Time for E-ZPass Users

A value of time for automobile and truck motorists is inherent in travel demand models, to estimate users' value of new roads, tolls, or other transportation services. For toll roads, the assumed value of time influences the behavior of drivers diverting to other roads to avoid paying tolls. The values of time used for these forecasts were calibrated during the backcast validation to match the response to past toll changes.

As a conservative assumption was used in the Status Quo with Increased Bonding Capacity and the Public Option, it was assumed that cash and E-ZPass customers have the same value of time, and thus behave similarly in response to changes in tolls and diversion. This assumption was necessary because E-ZPass was only introduced on the Turnpike in 2009, so there is limited historic data on the response of E-ZPass users to toll changes.

For a more optimistic assumption to reflect the different risk appetite of concessionaire equity and debt, the concession forecast assumed that E-ZPass users have a 10 percent higher value of time than cash users. This was based on observed insensitivity to toll increases amongst ETC users once the process

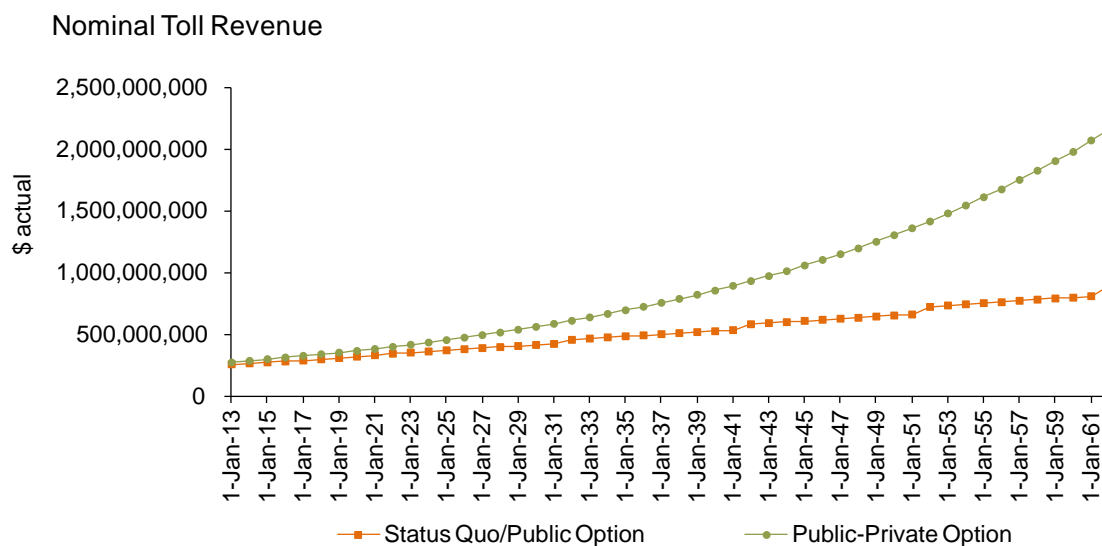
was fully automated. The assumed 10% difference²⁰ is based on surveys of toll users conducted in other regions. The result of this assumption is that E-ZPass users are less sensitive to toll increases and hence will not divert as much as cash users, which in aggregate slightly increases toll revenue under the Public-Private Option.

Toll Revenue Results

Toll Revenues for the Status Quo with Increased Bonding Capacity, the Public Option and Public-Private Option are shown below.

Status Quo with Increased Bonding Capacity and Public Option: The Status Quo with Increased Bonding Capacity and the Public Option assume that toll rates increase by the change in CPI for the first 10 years, followed by 10% increases every 10 years, while also including the ETC freeze for Local Trips for 10 years. After the first 10 years, the local freeze ends and the ETC tolls increase by 10% every 10 years.

Public-Private Option. The Public-Private Option assumes that cash toll rates increase annually at the change in CPI. ETC toll rates increase to match cash toll rates within the first five years, and then increase annually at the change in CPI. For Local Trips, ETC rates are frozen for ten years before increasing to match all other toll rates.



²⁰ Parsons Brinckerhoff confidential data, from a stated preference survey of toll road users in a major North American city. The survey found that ETC to cash value of time (VOT) ratio ranged from 1.0 to 1.27 depending on the trip purpose and the market segment. 1.1 is the rounded average across all purposes and market segments

Traffic Diversion Analysis

Traffic diversion is a key concern of toll policy evaluation. Traffic diversion under different toll policies was estimated based on diversion curves built from a series of sensitivity tests and calibrated to historic conditions.

The diversion curves allow the spreadsheet model to pivot off the statewide model forecast VMT, based on an option's assumptions regarding changes in toll rates. The curves were initially based on the sensitivity of travel demand from the Ohio statewide model, when comparing base year (2010) model runs made at five alternate toll rates: 0, 0.5, 1.5, 2.0, and 4.0 times their current values. The resulting shares of maximum VMT (with zero tolls) was plotted relative to the change in tolls. Two logit curves were fit through these points, one for trucks and another for autos. These curves were applied during the backcast validation, and the coefficients were adjusted by vehicle class to match the response to past toll rate changes.

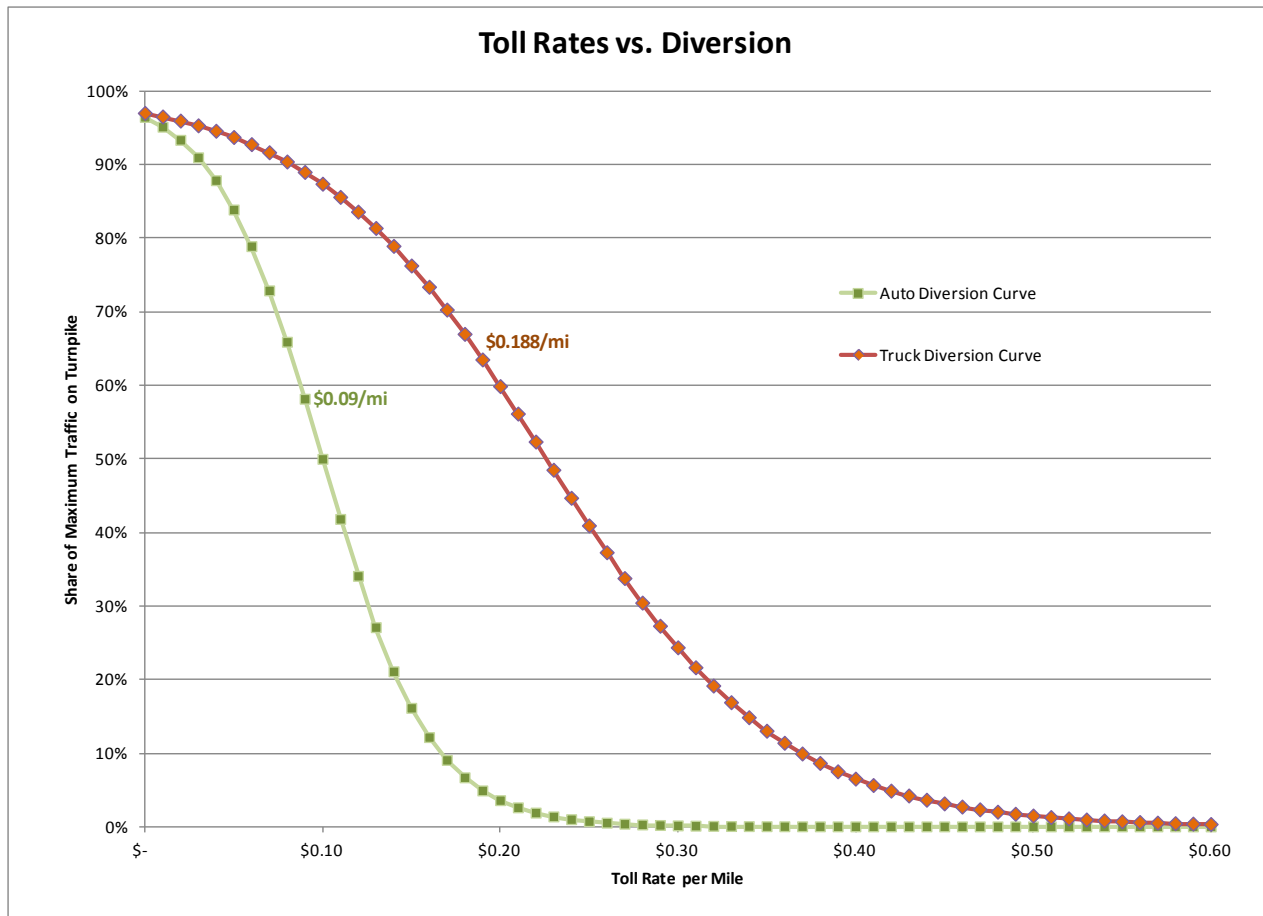
The form of the curve is:

$$\frac{VMT_0}{VMT_T} = \frac{e^{c_v + \alpha_v * T_v}}{1 + e^{c_v + \alpha_v * T_v}}$$

where: VMT_0 = VMT with zero tolls
 VMT_t = VMT with toll value T
 T_v = Toll rate per mile for vehicle class v
 c_v = Constant for vehicle class v
 α_v = Toll coefficient for vehicle class v

The diversion curve coefficients are shown below. Note that the toll coefficient can be translated into a value of time for interpretation, with the two measures being inversely proportional. Both values are shown in the table. The resulting curves are shown in the chart below.

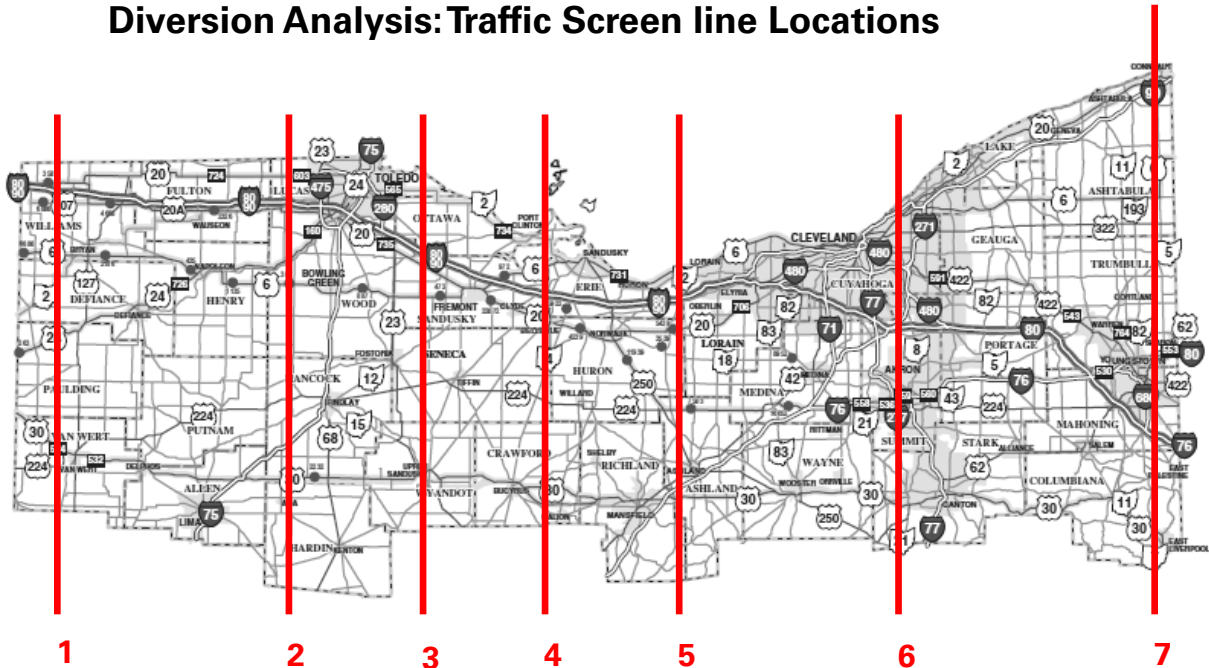
Vehicle Class	Constant (c_v)	Toll Coefficient (α_v)	Value of Time (\$/hr)
1	3.29	-33.41	\$22.00
2	3.46	-27.35	\$25.00
3	3.46	-22.79	\$30.00
4	3.46	-19.53	\$35.00
5	3.46	-17.09	\$40.00
6	3.46	-15.19	\$45.00
7	3.46	-13.67	\$50.00



An analysis was performed to determine which routes any traffic that may divert off of the Turnpike would use. This was done using the Statewide Model to measure the change in traffic volumes on alternate routes that would result from changes to the toll rates. The summary charts below show the alternate route diversion for the public and concession toll revenue scenarios outlined above.

To report on diversion analysis, northern Ohio is dissected by “screen lines” which provide a reference to the area of analysis. East-west traffic in the Turnpike corridor will either use the Ohio Turnpike or divert to parallel, east-west routes, depending on individual price sensitivity. The screen line locations used for the diversion analysis are shown in the graphic below.

Diversion Analysis: Traffic Screen line Locations



Current Truck Diversion

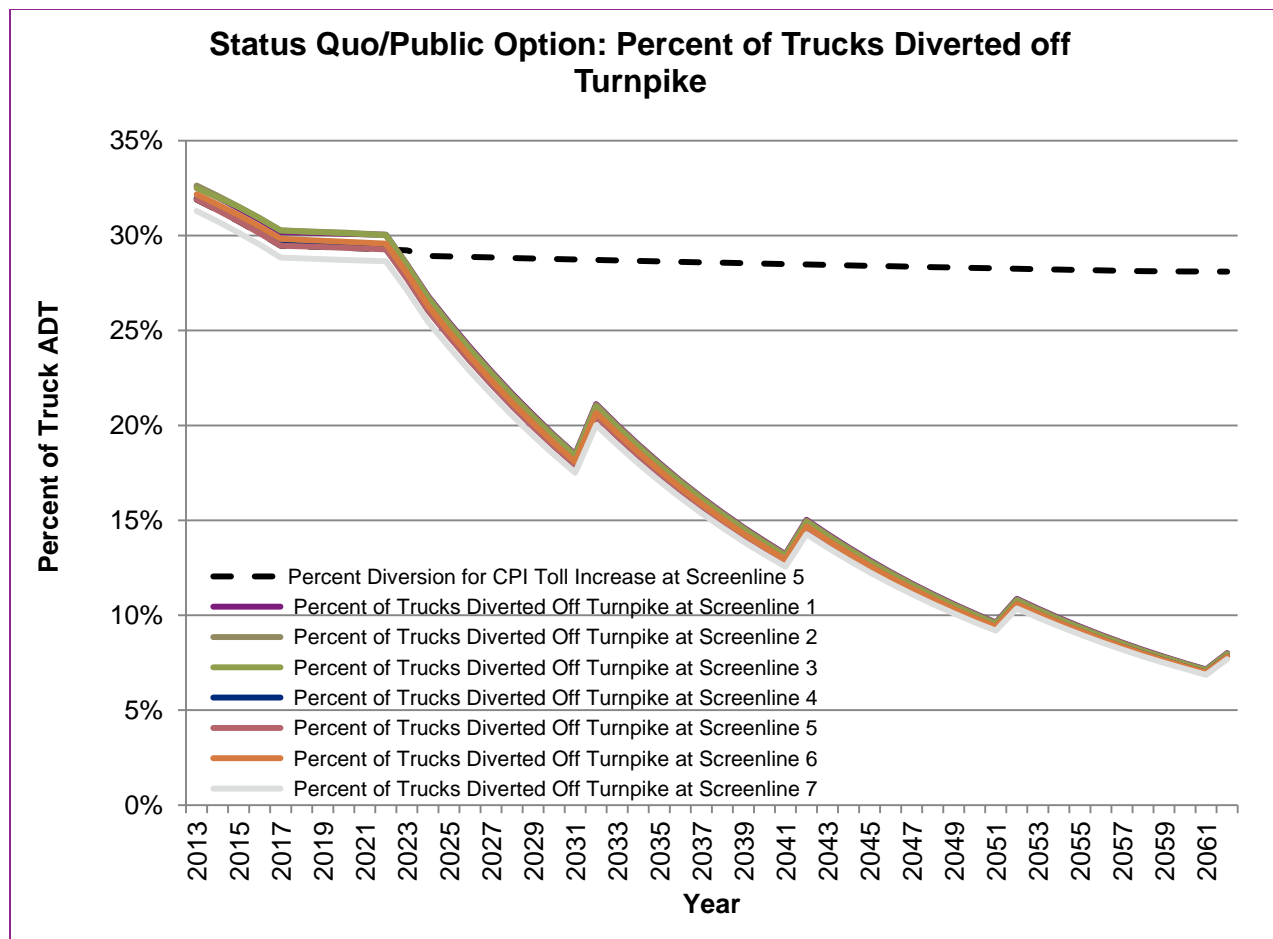
At current toll rates, approximately 30 percent of trucks divert from the Turnpike and use alternate, parallel routes. Examples of parallel routes used by trucks to avoid the Turnpike tolls are:

- US 20 in the western and central portion of the Turnpike corridor;
- SR 2, US 224, and US 250 in the central portion of the corridor;
- I-76 and US 422 in the eastern portion of the corridor.

Forecast Truck Diversion in the Status Quo with Increased Bonding Capacity, Public Option and Public-Private Option

Two graphs below illustrate the forecast for truck diversion, in percentage terms, for the Status Quo/Public Option and Public-Private Option toll cases. The graphs show the cumulative number of trucks diverted to all parallel roads in a given screen line.

The first graph shows the forecast for percentage truck diversion in the Status Quo/Public Option, where tolls increase at CPI for 10 years, then increase 10 percent every 10 years. The colored lines show the cumulative percent of truck traffic diverted for each of seven screenlines, and the dotted line shows diversion if tolls were increased at CPI annually for 50 years.



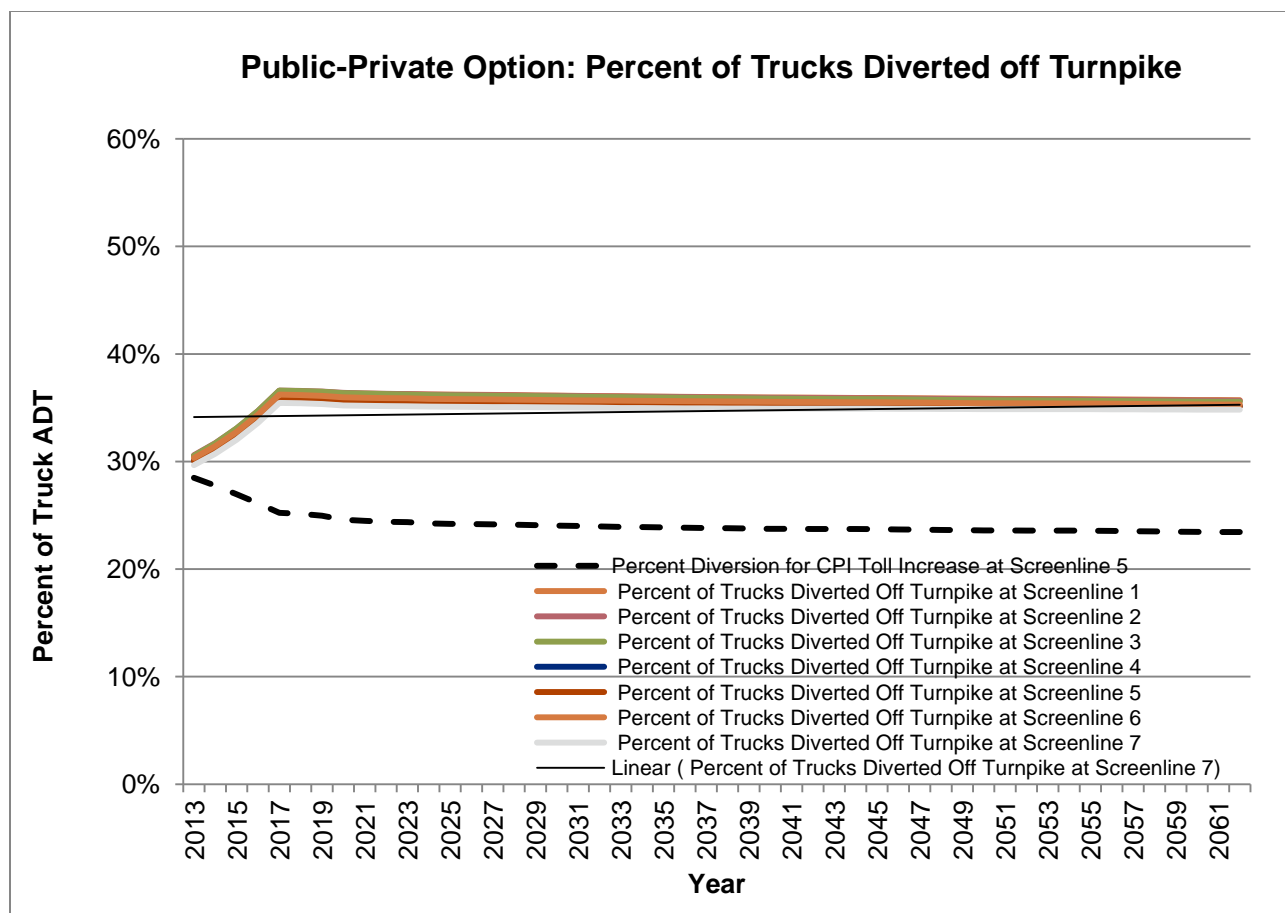
The graph shows the following:

- In the first 10 years, truck diversion is relatively static and tracks the CPI diversion curve;
- After 2023, the percentage of truck diversion decreases in a “saw tooth” pattern that reflects a cycle of 10 percent toll increases every 10 years; and

The key point is that after 10 years, toll rates do not keep pace with inflation and thus more trucks are attracted to the Turnpike over time.

The next graph shows the forecast for percentage truck diversion in the Public-Private Option case, where there are two key toll policy differences from the Status Quo/Public Option:

- In the first five years of the forecast, E-ZPass toll rates increase to the cash rate; and
- After five years, tolls increase at the annual CPI rate.



The graph shows the following:

- In the first five years, with E-ZPass rates equaling cash toll rates, tolls effectively increase at a rate greater than inflation (CPI); accordingly, the percentage of truck diversion goes from about 30 percent up to about 35% in the first five years; and
- After five years, tolls increase at CPI which results in no additional truck diversion. This effect is visualized by the screenline truck diversion curves paralleling the CPI curve (dotted line) after five years.

Ohio Turnpike Traffic Analysis

The Ohio Turnpike is a key transportation asset for northern Ohio, and it is also critical to interstate travel. ODOT's statewide travel demand model was used to analyze the origins and destinations of the Turnpike traffic to estimate the regions of Ohio with the greatest utilization of the road. Key findings of this analysis were:

- 45 percent of turnpike traffic passes through Ohio without stopping ("through trips")
 - 69 percent of truck traffic is "through trips"
 - 31 percent of automobile traffic is "through trips"
- The Ohio Turnpike serves a greater preponderance of longer, rural trips than local, commuter trips

- Only 2.5 percent of automobile trips travel one junction in the urban areas of Toledo, Cleveland or Youngstown
- 24 percent of automobile traffic travels only one segment, while only 7 percent of trucks make such trips
- 39 percent of total turnpike traffic has an origin or destination north of US 30
 - 51 percent of automobile traffic has an origin or destination north of US 30
 - 17 percent of truck traffic has an origin or destination north of US 30

Forecast of Other Revenue Generated by the Ohio Turnpike

The Turnpike also generates miscellaneous revenue from other activities, as shown in the tables below, with actual 2011 revenue from the OTC CAFR. These exclude revenue from the service plazas, which are addressed separately in this report.

Special Hauling Permit Revenue

	Status Quo	Public Option	Public-Private Option
Special Hauling Permits	There are permit fees for oversize and overweight trucks and escort vehicles. This is a very small percentage of traffic and some loads are restricted by OTC overhead bridge clearance.	Assumption that ODOT would administer special hauling permits and collect revenue.	Assumption that concessionaire would administer special hauling permits and collect revenue.
Annual Total	\$3.423m	\$3.423m	\$3.423m

Miscellaneous Leases and Licenses

	Status Quo	Public Option	Public-Private Option
Leases and Licenses	Lease and License revenues include revenue for fiber optic cable right of way leases, and cell tower leases.	ODOT would collect administer and collect this revenue, similar to programs for ODOT-managed right-of-way.	Concessionaire would not receive this revenue.
Annual Total	\$1.091m	\$1.091m	\$1.091m ²¹

²¹ Revenue would not be transferred to the Concessionaire, but remain Ohio state revenues.

State Motor Fuel Tax Revenue

	Status Quo	Public Option	Public-Private Option
State Fuel Tax Allocation	The OTC receives a portion of the State motor vehicle fuel tax.	Revenue would flow to State in some fashion to be determined	Concessionaire would not receive this revenue.
Annual Total	\$2.0m	\$2.0m	\$2.0m ²²

Advertising Revenue

	Status Quo	Public Option	Public-Private Option
Advertising	Revenue realized from advertising on certain of its properties.	ODOT would not receive this revenue.	Concessionaire would not receive this revenue.
Annual Total	\$0.151m	\$0.151m	\$0.151m ²³

Oil and Gas Royalty Income

	Status Quo	Public Option	Public-Private Option
Oil and Gas Royalty Income	Revenue from oil and gas royalties associated with mineral rights under the right-of-way	ODOT would receive this revenue	Concessionaire would not receive this revenue.
Annual Total	\$0.094m	\$0.094m	\$0.094m ²⁴

Operating Cost Forecast

The operating cost forecast was developed using OTC practices and costs as a baseline. This included the major categories of operating expenses, which are based on OTC operating cost categories and replicated for the Status Quo with Increased Bonding Capacity, the Public Option and the Public-Private Option in order to have 1:1 comparisons to the greatest extent possible.

To develop operating cost forecasts, engineers documented OTC costs as a baseline, and then used various sources of information to develop costs for the other options. The Status Quo with Increased Bonding Capacity uses the same operating practices and costs as OTC currently uses. The Public Option is based on ODOT operating practices and costs, which are described below. All costs were adjusted to be reflected in 2012 year of expenditure dollars. The main categories of Turnpike operating

²² *Ibid.*

²³ *Ibid.*

²⁴ *Ibid.*

expenses are shown in the table below, which also compares the different assumptions inherent to the Status Quo with Increased Bonding Capacity, Public and Public-Private operating options.

Summary of Operations Expense Assumptions

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Administration and Management	Based on OTC 2011 CAFR, forecast adjusted to reflect OTC cost reductions announced in 2012	Assumptions based on hypothetical ODOT toll management unit, with support functions provided by ODOT central office	Benchmarked based on Indiana Toll Road
Buildings and Facilities Maintenance	Cost forecast calculated based on OTC documents	Assumes closure of two out of eight OTC maintenance compounds	Assumes closure of two out of eight OTC maintenance compounds
Administration Building Maintenance	Cost forecast calculated based on OTC documents	Assumes closure of OTC administration building with staff housed in maintenance buildings	Assumes closure of OTC administration building with staff housed in maintenance buildings
Roadway and Structure Maintenance Salaries	Cost forecast calculated based on OTC documents	Staffing plan developed based on ODOT maintenance practices, using ODOT labor rates and fringe benefit calculation	Staffing plan developed based on ODOT maintenance practices, using private sector labor rates and fringe benefit calculation
Roadway and Structures Maintenance Materials	Cost forecast calculated based on OTC documents	Materials cost calculated based on five year average for ODOT freeway maintenance in Summit County, Ohio	Materials cost calculated based on five year average for freeway maintenance in Summit County, Ohio
Toll Collection	Cost forecast calculated based on OTC documents	Assumes outsourced toll collection via Qualified Management Contract	Services provided by Concessionaire
Service Plaza Operations	Cost forecast calculated based on OTC documents	Assumes outsourced management via concession or Qualified Management Contract	Services provided by Concessionaire
Traffic Control and Safety	Cost forecast calculated based on OTC documents	No change from OTC practices	No change from OTC practices

Administration and Management Salaries

Administration and management cost forecasts were based on OTC records and practices. The costs include the centralized management of toll road activities – e.g., executive; legal counsel; purchasing; human resources; and information technology. This category does not include labor costs for decentralized management of toll road operations – e.g., foreman, section heads, and division heads – which are accounted for in other Operations Expense categories.

Comparison of Staffing for Administration and Management Functions

Status Quo with Increased Bonding Capacity Source: 2011 OTC CAFR		Public Option	Public-Private Option
Commission	\$ 24,023	6 Positions <ul style="list-style-type: none"> ■ Deputy Director 6 for “Toll Road Operations” in the State ■ Toll Operations Administrator (Management Analyst Supervisor 2) ■ Assistant Toll Operations Administrator (Management Analyst Supervisor 2) ■ CFO (Fiscal Officer 2) ■ Systems Analyst ■ Administrative Assistant + Overhead ODOT fringe/overhead rate of 176.2%	14 Positions (Indiana Toll Road benchmark) <ul style="list-style-type: none"> ■ CEO (0.333 FTE) ■ COO ■ CFO (0.333 FTE) ■ Administrative Assistant ■ Information Technology Manager ■ Safety Manager ■ Director of Human Resources ■ Security Manager ■ Environmental Manager ■ Toll Audit Manager ■ Infrastructure Manager ■ Accounting Manager ■ Public Relations Manager ■ Infrastructure Program Director + Private sector fringe benefit rate of 33% ²⁵
Executive and Staff	\$ 369,791		
Public Affairs and Marketing Staff	\$ 176,099		
CFO/Comptroller and Staff	\$ 1,674,225		
Contracts Administration Staff	\$ 241,989		
Legal – In house and outside counsel	\$ 903,611		
Risk Management/Insurance	\$ 876,616		
Purchasing Staff	\$ 461,086		
Office Services Staff	\$ 772,405		
Human Resources (Salaries and Misc)	\$ 510,256		
Auditing (Salaries and Misc)	\$ 1,022,717		
Information Systems (Salaries, Software, Vendors)	\$ 1,712,594		

²⁵ Fringe benefit rate of 33% from US Bureau of Labor Statistics, *Employer Costs for Employee Compensation*, Data for Private Industry Workers in 15 Metropolitan Areas: Table 1. Employer Costs for Employee Compensation and associated relative standard error in private industry in the United States and by geographic region, census division, and locality, March 2009. Used data for the Detroit-Warren-Flint, MI MSA as a surrogate for northern Ohio private sector fringe benefit costs.

Costs for the Status Quo with Increased Bonding Capacity were developed using detail from the Turnpike's 2011 financial report.

Costs for the Public Option were developed based on the assumption that OTC would be more closely aligned with ODOT. The Turnpike would be maintained to the same standards that ODOT upholds for Ohio's interstate system. For the most part, these efficiencies would be realized by eliminating redundancy in functions. A standard ODOT overhead rate of 176.2% was applied to the raw labor costs, which reflects the cost of fringe benefits and administrative support.

Detail of ODOT Administration Salaries

ODOT Administration Assumptions	Hourly 2012\$	FTE	Annual Raw Labor Cost	ODOT Equivalent Used for OPEX
Toll Road Operations/CEO	\$49.53	1	\$103,022	Deputy Director 5
Administrative Assistant	\$24.54	1	\$51,043	Program Administrator 1
Toll Operations Administrator	\$37.06	1	\$77,085	Management Analyst Supervisor 2
Asst. Toll Operations Administrator	\$28.51	1	\$59,301	Management Analyst Supervisor 1
CFO/Comptroller	\$37.14	1	\$77,251	Fiscal Officer 2
Systems Analyst/IT Manager	\$28.51	1	\$59,301	Management Analyst Supervisor 1
Fringe and Overhead Rate	176.2%			

Ohio Department of Transportation Fringe and Central Office Allocation²⁶

Description	Totals
Indirect Labor	\$15,125,498.22
District Admin. Labor	10,830,941.73
Other Labor Cost	-
Employer Benefits (Fringe)	46,734,280.72
Total Indirect Labor	\$72,690,720.68
Non-Labor Indirect	9,606,653.41

²⁶ Source: Electronic mail from Jim Snyder, Ohio DOT, to Howard Wood, Parsons Brinckerhoff, August 13, 2012

Central Office Admin.	21,196,825.62
Total Non-Labor Indirect	\$30,803,479.04
Total Overhead Cost	103,494,199.71
Direct Labor	\$58,725,043.90
Total Overhead Rate	176.24%

Costs for the Public-Private Option were calculated using the Indiana Toll Road concession management structure as a benchmark.²⁷

Detail of Concessionaire Administration Salaries

Concessionaire Administration Assumptions	Hourly 2012\$	FTE	Annual Raw Labor Cost
Chief Executive Officer	\$66.72	0.33	\$45,797
Chief Operations Officer	\$57.72	1	\$120,058
Chief Financial Officer	\$63.55	0.33	\$43,621
Administrative Assistant	\$24.96	1	\$51,917
Information Technology Manager	\$44.74	1	\$93,059
Safety Manager	\$34.88	1	\$72,550
Director of Human Resources	\$34.88	1	\$72,550
Security Manager	\$34.88	1	\$72,550
Environmental Manager	\$34.88	1	\$72,550
Toll Audit Manager	\$36.49	1	\$75,899
Infrastructure Manager	\$34.88	1	\$72,550
Accounting Manager	\$34.88	1	\$72,550
Public Relations Manager	\$34.88	1	\$72,550
Infrastructure Program Director	\$34.88	1	\$72,550
Fringe and Overhead Rate	33%		

²⁷ ITR Website and interviews

Buildings and Facilities Maintenance

The buildings and facilities maintenance costs for each option were developed using the 2011 OTC CAFR. The Public and Public-Private Option's costs were derived by prorating the OTC costs to adjust for reductions in facilities. For example, it is assumed that two of the existing eight compounds will be closed under the Public Option and the Public-Private Option. As a result, the Turnpike maintenance buildings' costs were reduced by 25 percent.

Comparison of Active Buildings and Facilities

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Maintenance buildings, excludes toll plazas and service plazas	Eight total maintenance compounds	Six maintenance compounds OTC costs pro-rated based on assumed facility reduction	Six maintenance compounds OTC costs pro-rated based on assumed facility reduction

Administration Building Maintenance

Costs for the Status Quo with Increased Bonding Capacity and Public Option base case were taken from the Turnpike's 2011 CAFR and adjusted to increase to 2012 year-of-expenditure dollars. Adjustments were made to the 2012 OTC costs to account for closure of the Administration Building under the Public and Public-Private Options.

The Public Option assumes closure of the existing Administration Building, with staff collocating in either ODOT District Offices or existing Turnpike maintenance facilities. The Public-Private Option assumes that existing Administration Building will be closed and the administrative functions will be housed at an existing facility at one of the maintenance facilities.

Similar to the buildings and facilities maintenance costs, the Administration Building costs were reduced to zero under the Public and Public-Private Options since it is assumed this building will be closed under those scenarios.

Comparison of Administrative Building Assumptions

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Administration Building Costs	Remains open	Closed, located in ODOT district or Turnpike maintenance facility	Closed, combined with a maintenance facility

Roadways and Structures Maintenance Salaries

Roadways and Structures Maintenance includes the labor and management supervision necessary to perform reactive and preventive maintenance, and winter maintenance (snow plowing and application of salt, brine and grit).

Summary of Roadway and Structures Maintenance Cost Assumptions

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Manager Equivalents	14 Division level staff; cost calculated based on OTC 2011 CAFR	5 "Division Level" maintenance staff; cost detail provided below	2.5 "Division Level" staff, to oversee road and structure maintenance; cost detail provided below
Foreman Equivalents	41 "Section" mgt staff, eight sections; cost calculated based on OTC 2011 CAFR	18 "Section" mgt staff, six sections; cost detail provided below	12 "Section" mgt staff, six sections; cost detail provided below
Laborer Equivalents	Section Labor: 207 Full Time; cost calculated based on OTC 2011 CAFR	Section Labor: 129 Full Time, 65 Winter Seasonals (32.5 FTE); cost detail provided below	Section Labor: 129 Full Time, 65 Winter Seasonals (32.5 FTE); cost detail provided below

Status Quo Roadway and Structures Maintenance Salaries

Costs for the Status Quo with Increased Bonding Capacity were developed from the OTC's records and interviews with OTC staff.

Public Option Roadway and Structures Maintenance Salaries

Costs for the Public Option were developed based on a review of Turnpike maintenance practices in comparison to ODOT maintenance practices. The Public Option maintenance staffing was built "bottoms up" based on the lane miles, location of maintenance facilities, and distance of efficient snow and ice routes. The Public Option also considered the relative efficiency of OTC labor practices as documented in their agreement with the Teamsters Union, compared to ODOT labor practices as documented in their agreement with AFSCME Union. The Public Option analysis assumed a reduction of maintenance compounds from eight to six. Current ODOT labor rates were used to calculate costs.

Public Option Roadway Maintenance Labor Cost

Division Positions	Hourly 2012\$	FTE	Annual	ODOT Equivalent Used to Calculate Cost
Highway Maintenance Administrator	\$44.19	1	\$91,915	Deputy Director 5

Roadway Services Administrator	\$43.24	1	\$89,939	Transportation Engineer 4
Snow and Ice Coordinator	\$30.99	1	\$64,459	Snow and Ice Coordinator
Transportation Administrators	\$24.54	4	\$204,173	Program Administrator 1

Section Positions	Hourly 2012\$	FTE	Annual	ODOT Equivalent Used to Calculate Cost
Transportation Managers 2	\$26.84	18	\$1,004,890	Transportation Manager 2
Account Clerk 2	\$19.01	4	\$158,163	Account Clerk 2
Automotive Technicians	\$21.39	18	\$800,842	Automotive Technician
Highway Technicians 2	\$18.69	35	\$1,360,632	Highway Technician 2
Highway Technicians 1	\$16.33	72	\$2,445,581	Highway Technician 1
Seasonal Employees	\$12.00	32.5	\$811,200	Seasonal
Fringe and Overhead Rate	176.2%			

Public-Private Option Roadway and Structures Maintenance Salaries

Costs for the Public-Private Option were developed based on analysis of the labor force needed for reactive and preventive maintenance, and winter maintenance. The level of management oversight was assumed to be lower in the Public-Private Option than the Public Option. The Public-Private Option assumed a reduction of maintenance compounds from eight to six. Concession labor costs were calculated based on Bureau of Labor Statistics reports²⁸ for non-union labor in northern Ohio, for work categories equivalent to highway laborers.

ODOT-Equivalent Job Classification	Hourly Rate \$2012	FTE	Annual
Highway Maintenance Administrator	\$46.26	1	\$96,221
Transportation Administrator	\$29.46	1.5	\$91,915
Transportation Managers	\$38.44	12	\$959,462

²⁸ Bureau of Labor Statistics, May 2011 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates. Analysis considered the metropolitan areas of Cleveland, Sandusky, Toledo, and Youngstown, and selected the highest median hourly wage rates from those areas. The Roadway and Structures Maintenance Salaries for the Concession Scenario used the Major Occupational Groups of Office and Administrative Support Occupations for Account Clerks; Installation, Maintenance and Repair Occupations for Automotive Technicians; and Transportation and Material Moving Occupations for all other labor categories.

ODOT-Equivalent Job Classification	Hourly Rate \$2012	FTE	Annual
Account Clerk 2	\$19.01	4	\$158,163
Automotive Technicians	\$21.39	18	\$800,842
Highway Technicians 2	\$18.69	35	\$1,360,362
Highway Technicians 1	\$16.33	72	\$2,455,581
Seasonal Employees	\$12.00	32.5	\$811,200
Fringe and Overhead Rate	33%		

Roadway and Structures Maintenance Materials Cost

To calculate maintenance materials for the Public and Public-Private Options, ODOT supplied actual material expenses for maintaining freeways in Summit County, Ohio (Akron), averaged over three consecutive years: 2009 – 2011. These costs were divided by the number of freeway lanes miles in Summit County (357 lane miles) to derive per lane-mile materials cost. This per lane-mile cost was then applied to Turnpike lane-miles (1,248) to calculate roadway and maintenance materials costs under the Public Option and Public-Private Option.

Material	Quantity	Unit	Direct Cost	Summit County Lane Mile Cost	Extrapolation To Turnpike Lane Miles
MORTAR, SAND MIX, TYPE-S, 80#	87	BG	\$556.80	\$1.56	\$1,946.46
QUICKCRETE 5000 (80LB)	45	BG	\$288.25	\$0.81	\$1,007.66
CEMENT, 80# BAG	13	BG	\$145.53	\$0.41	\$508.74
CONCRETE, READY MIX, 80#BG	11	BG	\$40.15	\$0.11	\$140.36
LIQUID ASPHALT, RS-2, ANIONIC	2,221.40	GL	\$5,026.89	\$14.08	\$17,572.99
HERBICIDE, PROSECUTOR PRO	28.63	GL	\$648.53	\$1.82	\$2,267.13
FILLER, CRACK, KOLD FLO	27.5	GL	\$198.00	\$0.55	\$692.17
LIQUID ASPHALT, SS-1, ANIONIC	40	GL	\$120.00	\$0.34	\$419.50
PENETRANT, ENCHANCER, 1 GL STICKE	3.42	GL	\$111.32	\$0.31	\$389.15

Material	Quantity	Unit	Direct Cost	Summit County Lane Mile Cost	Extrapolation To Turnpike Lane Miles
LIQUID ASPHALT, SS-1H, ANIONIC	20.6	GL	\$85.76	\$0.24	\$299.80
SURFACTANT, LOW FOAM, NONIONIC SP	1.57	GL	\$51.10	\$0.14	\$178.64
HERBICIDE, AMINE 2,4-D	150	GL	\$5,785.00	\$16.20	\$20,223.19
LIQUID ASPHALT, AC-20	50	GL	\$718.50	\$2.01	\$2,511.73
LUBE, RUBBER	1	GL	\$6.05	\$0.02	\$21.15
ANTI-FREEZE, PLUMBING F/RECREATIO	1	GL	\$5.33	\$0.01	\$18.63
SEED, GRASS, 40-40-20	84	LB	\$109.25	\$0.31	\$381.92
SALT	22,000.00	TN	\$924,000.00	\$2,588.24	\$3,230,117.65
CALCIUM CHLORIDE, LIQUID	1,858.50	GL	\$1,159.65	\$3.25	\$4,053.90
SALT BRINE	750,000.00	GL	\$52,500.00	\$147.06	\$183,529.41
BEET HEET CONCENTRATE	897.33	GL	\$1,202.42	\$3.37	\$4,203.42
GEOMELT, DE-ICER, AND SALT BRINE	1,991.00	GL	\$796.84	\$2.23	\$2,785.59
ASPHALT CONCRETE, ITEM 448, TYPE	193.99	TN	\$11,297.89	\$31.65	\$39,495.14
COLD MIX, HPM	103.02	TN	\$10,255.67	\$28.73	\$35,851.75
LIMESTONE, #411	200.1	TN	\$3,051.52	\$8.55	\$10,667.50
LIMESTONE, #9	65.48	TN	\$941.94	\$2.64	\$3,292.83
ASPHALT, RECYCLED PAVEMENT	443.96	TN	\$556.89	\$1.56	\$1,946.78
LIMESTONE, #2	27.99	TN	\$431.61	\$1.21	\$1,508.82
ASPHALT CONCRETE, 301 BASE	7.27	TN	\$384.67	\$1.08	\$1,344.73
DUMP ROCK FILL, TYPE D	14	TN	\$367.50	\$1.03	\$1,284.71
TOPSOIL	40	TN	\$240.00	\$0.67	\$838.99
RIPRAP	196.6	TN	\$222.05	\$0.62	\$776.24

Material	Quantity	Unit	Direct Cost	Summit County Lane Mile Cost	Extrapolation To Turnpike Lane Miles
LIMESTONE, #304	14.5	TN	\$207.25	\$0.58	\$724.50
GRAVEL, #57	11.02	TN	\$127.01	\$0.36	\$444.00
LIMESTONE, #57	5.69	TN	\$87.02	\$0.24	\$304.20
SAND, SPILL, #10 SCREENING	0.5	TN	\$2.25	\$0.01	\$7.87
Total			\$1,021,729		\$3,571,757

Toll Operations (Includes Salaries and other Operating Costs)

The Turnpike is a gated system with manual and ETC capabilities. The ETC system is three years old. The OTC provided the following accounting of current cash and ETC toll collection costs.

Ohio Turnpike Commission Analysis of Toll Collection Cost per Transaction, 2011

Ohio Turnpike Commission Toll Collection Cost Per Transaction					
	Cash	% of Total	E-ZPass	% of Total	Total
Exiting Vehicles	28,517,432	58%	20,785,147	42%	49,302,579
Toll Revenue	\$ 114,045,989	49%	\$ 117,491,447	51%	\$ 231,537,436
Revenue per transaction	\$ 4.00		\$ 5.65		\$ 4.70
Toll Collection Costs					
Director of Toll Operations and Staff					
Salaries - FT	235,587	58%	171,710	42%	407,297
Travel	9	58%	7	42%	16
Automobile	2,725	58%	1,986	42%	4,711
	238,321	58%	173,702	42%	412,024
General Toll Operations Expenditures					
Salaries - FT	257,217	58%	187,474	42%	444,691
Travel	1,029	58%	750	42%	1,779
Office Furniture & Supplies	15,428	58%	11,245	42%	26,673
Equipment Rental & Maintenance	7,168	58%	5,224	42%	12,392
Automobile	7,411	58%	5,401	42%	12,812
Emergency	39	58%	29	42%	68
Credit Card Fees	207,095	7%	2,906,940	93%	3,114,035
CC Reimbursement - Toll Author	-	0%	(235,131)	100%	(235,131)
Uncollectible Toll Revenue	12,964	50%	12,964	50%	25,927
Uniforms	7,251	100%	-	0%	7,251
Transponders	-	0%	660,840	100%	660,840
Toll Tickets	286,241	100%	-	0%	286,241
Equip Maint-Term & Computer	332,803	58%	242,566	42%	575,368
Equip Maint-Class Equip	323,292	58%	235,634	42%	558,926
Equip Maint-Treadles	120,729	58%	87,994	42%	208,724
Armored Car Service	415,473	100%	-	0%	415,473
Equip Maint - LED Lane Signage	43,905	58%	32,001	42%	75,906
Equip Maint - Toll Lane Gates	45,787	58%	33,372	42%	79,159
	2,083,831	33%	4,187,302	67%	6,271,133
Toll Plaza Expenditures					
Salaries - PT	6,106,102	100%	-	0%	6,106,102
Salaries - FT	28,416,694	100%	-	0%	28,416,694
Office Furniture & Supplies	51,505	100%	-	0%	51,505
Heat, Light and Water	1,115,166	58%	812,797	42%	1,927,963
Telephone	17,313	100%	-	0%	17,313
Custodial and Janitorial	154,449	100%	-	0%	154,449
Uniforms-Clean and Launder	16,875	100%	-	0%	16,875
	35,878,104	98%	812,797	2%	36,690,901
Total Toll Collection Costs	38,200,257	88.07%	5,173,801	11.93%	43,374,058
Toll collection cost per transaction	\$ 1.34		\$ 0.25		\$ 0.88
Toll collection cost as a % of revenue	33.5%		4.4%		18.7%
IAG Annual Dues	-	0%	70,000	100%	70,000
Customer Service Center Wage & Fringe	-	0%	473,644	100%	473,644
Total	38,200,257	86.98%	5,717,446	13.02%	43,917,703
Toll collection cost per transaction	\$ 1.34		\$ 0.28		\$ 0.89
Toll collection cost as a % of revenue	33.5%		4.9%		19.0%

The OTC toll collection cost per transaction is \$1.34 for cash, and \$0.28 for ETC.

Numerous sources were reviewed to develop transaction costs for the Public Option and Public-Private Option, including internal PB practitioners and external literature. Cost per transaction includes the total O&M cost associated with toll collection, excluding capital expenditures. Ranges are provided below:

- Industry benchmarks for ETC vary from \$0.01 to \$0.10 per tag based transaction (*source: Evaluation of Public Private Partnerships, Washington State Joint Transportation Committee, January 19, 2012*)
- For four projects in the Puget Sound region, ETC costs were estimated at \$0.83 – \$1.13 per transaction for public sector case (using Public Sector Comparator); and from \$0.20 – \$0.35 per transaction in a Concession (*source: Evaluation of Public Private Partnerships, Washington State Joint Transportation Committee, January 19, 2012*).
- Washington State Department of Transportation Toll Benchmark Survey (*January 2009*) surveyed several agencies to determine a cost per transaction. All the agencies surveyed used a mix of manual/cash toll collection, and ETC, and the report calculated only an average cost per transaction for both types of toll collection:
 - E-470, outsourced toll collection services, mix of cash and ETC: \$0.68/transaction average
 - Central Texas Regional Mobility Authority, outsourced toll collection services, mix of cash and ETC: \$0.45/transaction average
 - Bay Area Toll Authority, public-sector toll collection (CalTrans), mix of cash and ETC: \$0.84/transaction average
 - Golden Gate Bridge, Highway and Transportation District, public-sector toll collection (District Staff), mix of cash and ETC: \$2.02/transaction average
 - Washington State Department of Transportation (SR 167 HOT Lanes and Tacoma Narrows Bridge), public-sector toll collection, mix of cash and ETC: \$0.86/transaction average.
- As of 2011, Miami-Dade Expressway Authority's cost is 6 cents per toll transaction; Tampa Hillsborough Expressway Authority's cost is 10 cents per transaction, and Orlando-Orange County Expressway Authority's cost is 11 cents per transaction. (*source: Should Florida Toll Agencies Be Consolidated?, Reason Foundation, 2012*)
- According to a 2002 study by the California Center for Innovative Transportation, the cost per transaction of an ETC system is between \$0.05 to \$0.10. A manual toll cost per transaction is \$0.35 to \$0.45. (*source: Smith, ITS Decision, 2002*)
- For the Pennsylvania Turnpike, it costs the commission about \$1 per transaction to collect a cash toll, and less than 25 cents per transaction to collect tolls via E-ZPass. (*source: PA Turnpike Reminds Motorists of 10% Cash-Only Toll Increase Next Year, Pa. Turnpike 2012 Press Release: 12/16/2011*).
- Cash collection at the NJ Turnpike Authority is about \$0.45/transaction (*source: New Jersey Turnpike board to consider outsourcing manual toll collection pending AET, By Peter Samuel on July 14, 2010*).
- For the Golden Gate Bridge, Highway and Transportation District, cash is estimated to cost \$0.83 per transaction, and ETC \$0.25 per transaction. (*source: Update on Golden Gate Bridge All Electronic Tolling Friday, Sept. 21, 2012 GGBHTD Board to Amend Master Ordinance Policies for All Electronic Tolling*)

- Newspaper accounts from Virginia indicated ETC transaction costs of approximately \$0.07 per transaction (*source: Richmond Times-Dispatch, July 14, 2012*)
- Recent analysis of the Florida Turnpike Enterprise, a collection of toll roads with outsourced toll collection and back office functions, found ETC collection costs of \$0.085 per transaction, and cash collection costs of \$0.32 per transaction (*source Reason Foundation, 2012*).

Literature Review – Cost of Toll Collection for Public Agency Operations

Agency/Reference	Source (Year)	ETC Cost/ Transaction	Cash Cost/ Transaction	Avg Cost/ Transaction
Ohio Turnpike Commission	OTC (2011)	\$0.28	\$1.34	\$0.89
Puget Sound (Public Sector Comparator)	Evaluation of Public Private Partnerships, Washington State Joint Transportation Committee (2012)	\$0.83 to \$1.13	NR	NR
Bay Area Toll Authority (public)	WSDOT Toll Benchmark Survey (2009)	NR	NR	\$0.84
Golden Gate Bridge (public)	WSDOT Toll Benchmark Survey (2009)	NR	NR	\$2.02
WSDOT (public)	WSDOT Toll Benchmark Survey (2009)	\$0.32	\$0.89	\$0.50
Penn Turnpike (public)	Pa. Turnpike Press Release, Harrisburg, PA (12/16/2011)	\$0.25	\$1.00	NR
NJ Turnpike (public)	“New Jersey Turnpike board to consider outsourcing manual toll collection pending AET,” Tollroadsnews, Samuel (July 14, 2010)	NR	\$0.45	NR
Golden Gate Bridge (public)	“Update on Golden Gate Bridge All Electronic Tolling,” GGBHTD (Friday, Sept. 21, 2012)	\$0.25	\$0.83	NR

Literature Review – Cost of Toll Collection for Private/Outsourced Toll Operations

Agency/Reference	Source/Year	ETC Cost/ Transaction	Cash Cost/ Transaction	Avg Cost/ Transaction
Ohio Turnpike Commission	OTC/2011	\$0.28	\$1.34	\$0.89
“Industry Benchmarks”	Evaluation of Public Private Partnerships, Washington State Joint Transportation Committee (2012)	\$0.01 to \$0.10	NR	NR
E-470 (outsourced)	WSDOT Toll Benchmark Survey (2009)	NR	NR	\$0.68
Central TX RMA (outsourced)	WSDOT Toll Benchmark Survey (2009)	NR	NR	\$0.45
“Industry Benchmarks”	Smith, ITS Decision, California Center for Innovative Transportation (2002)	\$0.05 to \$0.10	\$0.35 to \$0.45	NR
Virginia DOT (outsourced)	Bacque, Richmond Times-Dispatch, July 14, 2012	\$0.0426 cents per toll transaction and 1.923% of the total revenue processed (\$0.031) = \$0.0736	NR	NR
Florida Turnpike Enterprise (outsourced)	Should Florida Toll Agencies Be Consolidated?, REASON, 2012	\$0.085	\$0.32	\$0.146
AVERAGE		\$0.0709	\$0.36	\$0.26

Based on literature review, internal experts, and experience with other private projects, it is reasonable to calculate an average private-sector toll collection cost of \$0.07/transaction for ETC, and \$0.36/transaction for cash collection. To be conservative in the analysis of the Public-Private Option, this analysis assumes an ETC cost/transaction of \$0.10, and cash cost/transaction of \$0.45.

The Public Option assumes that toll collection will be outsourced via a Qualified Management Contract. Due to public procurement, and shorter terms, there would be less risk shift to the private sector. Accordingly, the Public Option used an ETC cost per transaction of \$0.21, and cash cost per transaction of \$0.67. These figures are in the range of comparable public and private toll facilities, but the assumption is purposefully conservative for this analysis.

Summary of Toll Transaction Cost Assumption for the Three Options

Technology	Status Quo with Increased Bonding Capacity Cost Per Transaction 2011	Average Private/ Outsourced	Public Option Cost Per Transaction	Public-Private Option Cost Per Transaction
Cash	\$1.34	\$0.36	\$0.67	\$0.45
Electronic Toll Collection	\$0.28	\$0.07	\$0.21	\$0.10

Toll Costs Variable with Traffic and ETC Penetration Rate

The Operating Cost model calculates toll collection as a variable cost that changes based on the number of transactions, which is derived from traffic volume. The other variable is ETC penetration rate, which changes over time. Steps in the operating expenses model are:

- Number of transactions: calculated by current ratio of transactions to traffic volume;
- Traffic volume from the Traffic & Revenue ("T&R") model are inputs to the Toll operating expenses, converted into transactions by the ratio above;
- Transactions split between cash and ETC based on ETC penetration rate table; and
- Transactions multiplied by cost provide annual toll op cost.

Ramp Down of Operating Costs between Status Quo and Public Option

Due to many different factors detailed in this report, operating costs are significantly lower in the Public Option, compared to the Status Quo with Increased Bonding Capacity. However, if there was a change in public operation of the Turnpike, operating costs would not change immediately because there would be a plethora of transition items to resolve, new contracting approaches to implement for toll collection and service plaza operation, and a period of either attrition or reassignment of existing Turnpike staff to new duties. Because of this transition period, all operating costs for the public scenario were "ramped down" from current OTC operating costs to more efficient operations, over a period of 10 years.

Capital Cost Forecasts

To develop capital cost forecasts, engineers reviewed OTC inventory and inspection records, third-party engineering reports, performed field reviews, interviewed OTC and ODOT staff and pulled data from ODOT databases for bridge and pavement condition. Capital requirements were forecast based on condition data and replacement cycles. Costs were developed based on data from the OTC, ODOT or other sources as noted. All costs were adjusted to be reflected in 2012 year of expenditure dollars.

The Turnpike has been very well maintained throughout its history, but there are major capital needs over the next 50 years to replace pavement, perform capital maintenance on bridges, and invest in the many other capital assets of the Turnpike.

Summary Capital Expenditure Assumptions

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Roadside (signs, lighting, guardrail, etc)	Used OTC records and field verification to confirm inventory; lifecycle and replacement costs based on industry data, OTC records and ODOT bid tabulations	Used OTC records and field verification to confirm inventory; lifecycle and replacement costs based on industry data, OTC records and ODOT bid tabulations	Used OTC records and field verification to confirm inventory; lifecycle and replacement costs based on industry data, OTC records and ODOT bid tabulations. Cost discount of 10 percent for concession option. ²⁹
Pavement	Assumes full depth reconstruction of original pavement at 5 centerline miles per year, plus resurfacing. Construction of 3 rd lane as per OTC capital plan.	Assumes full depth reconstruction of original pavement at 10 centerline miles per year, plus resurfacing to meet ODOT Pavement Condition Rating (PCR) goals. Completion of 3 rd lane project (MP 59.5 to 64.1) in 2013-2014.	Assumes full depth reconstruction of original pavement in years 10 through 27 of the concession term, with resurfacing to meet ODOT PCR goals. No 3 rd lane construction. Cost discount of 10 percent for Public-Private Option.
Structures	Developed cost forecast based on age and condition of OTC bridge and culvert inventory	Developed capital forecast based on age and condition of OTC bridge and culvert inventory	Developed capital forecast based on age and condition of OTC bridge and culvert inventory. Cost discount of 10 percent for Public-Private Option.

²⁹ Concessionaire capital costs for major pavement, bridge and other capital costs were assumed to be 10 percent lower than the public sector cases. This assumption stems from literature regarding private sector efficiencies in construction procurement, using methods such as design-build. Concessionaires can also exercise their leverage in sourcing material through long term contracts with suppliers.

The US DOT Federal Highway Administration maintains a comprehensive reference of public-private partnership resources at <http://www.fhwa.dot.gov/ipd/p3/resources/> (last accessed September 4, 2012), which includes analyses and case studies of the cost savings available through public private partnership procurements. The basis for 10 percent capital cost discount for the concessionaire case is the USDOT Report to Congress on Public-Private Partnerships, December 2004, which examined 21 case studies of P3s and innovative contracting, showing an average cost savings from innovative contracting methods of six to forty percent. To be conservative in estimating the benefits of the Public-Private Option, a 10 percent discount for capital costs was used for this analysis.

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Other CapEx	Category to capture misc costs in OTC capital plan	Includes only ITS, Sandusky County slope repairs, and engineering costs associated with capital projects	Includes only ITS, Sandusky County slope repairs, and engineering costs associated with capital projects
Buildings	Developed cost forecast based on square footage and construction type of individual buildings at maintenance outposts and for the administration building. Includes replacement cost of toll plazas.	Developed cost forecast based on square footage and construction type; assumed closure of two maintenance compounds and the OTC administration building. Excludes replacement of the Oak Openings/Fallen Timbers service plazas in 2014-2015.	Developed cost forecast based on square footage and construction type; assumed closure of two maintenance compounds and the OTC administration building. Includes replacement of the toll plazas. Cost discount of 10 percent for Public-Private Option.
Equipment	Cost based on OTC inventory, age, replacement cycles, and replacement costs	Equipment inventory developed based on ODOT maintenance practices and replacement cycles	Equipment inventory developed based on ODOT maintenance practices and replacement cycles.
Tolling Equipment	Developed forecast based on age and condition of OTC tolling equipment, and industry standard lifecycle data	Developed forecast based on age and condition of OTC tolling equipment, and industry standard lifecycle data	Developed forecast based on age and condition of OTC tolling equipment, and industry standard lifecycle data. Cost discount of 10 percent for Public-Private Option.

Pavement Capital Cost Forecast

Except for 10 centerline miles, the Turnpike's pavement is original to its construction in 1954 and 1955. The Ohio Turnpike mainline consists of two or three eastbound and westbound travel lanes of 10 inches reinforced Portland Cement Concrete ("PCC"), all of which has been resurfaced with four and a half to seven inches of asphaltic concrete, each flanked by paved shoulders eight feet wide on the inside and 10 feet, three inches wide on the outside of the mainline roadway. The shoulders are hard surfaced with asphaltic concrete.

Starting in 1995, the Ohio Turnpike added a third lane between Interchange 59 and Interchange 218. Unlike the original composite pavement design, this newer, third lane section is primarily full-depth asphalt design. The construction of the third lane eliminated the 56 foot center strip of grass median,

replacing it with two 12 foot traffic lanes, two 14 foot three inch wide paved shoulders and a 50 inch high concrete barrier.

When the third lane was constructed, the projects did not include replacement of the original composite pavement. Thus for approximately 150 centerline miles of the Turnpike, the right lanes of the roadway are 58 year old, composite pavement, and the left lane and shoulder are newer (built from 1995 to 2010), full depth asphalt. Most truck traffic travels on the older pavement.

Technical Review of Pavement Condition

To develop a capital forecast, engineers had access to various data sources and interviewed OTC and ODOT engineering staff. Data sources reviewed were:

- PCR data collected by ODOT from 2004 to 2011. PCR is a visual inspection process which records the presence and extent of pavement distresses, and deducts values for each distress. Pavement with no distresses is rated 100 on the PCR scale. ODOT considers pavement below PCR of 65 to be in need of some form of rehabilitation.
- OTC project history: the OTC has a comprehensive history of the maintenance performed on its pavement, including the year of the project and type of intervention – e.g., resurfacing and overlays.
- Traffic history, as calculated by Equivalent Single Axle Load (ESAL) values.
- *Mainline Pavement Evaluation* Master Plan Report (referred to as “OTC Pavement Master Plan” or “Master Plan”), September 25, 2009. This report, prepared for the OTC by Resource International engineering consultants, was developed based on extensive pavement testing methods, including:
 - Automated data collection of roughness (IRI), rutting, pavement cross slope, and faulting;
 - Ground Penetrating Radar;
 - Pavement core samples;
 - Subgrade shear strength measured by Automated Dynamic Cone Penetrometer; and
 - Pavement layer strength measured by Falling Weight Deflectometer.

After reviewing this data and interviewing OTC and ODOT engineering staff, a pavement capital maintenance plan was developed for the cost forecast.

Ohio Turnpike Pavement Maintenance History

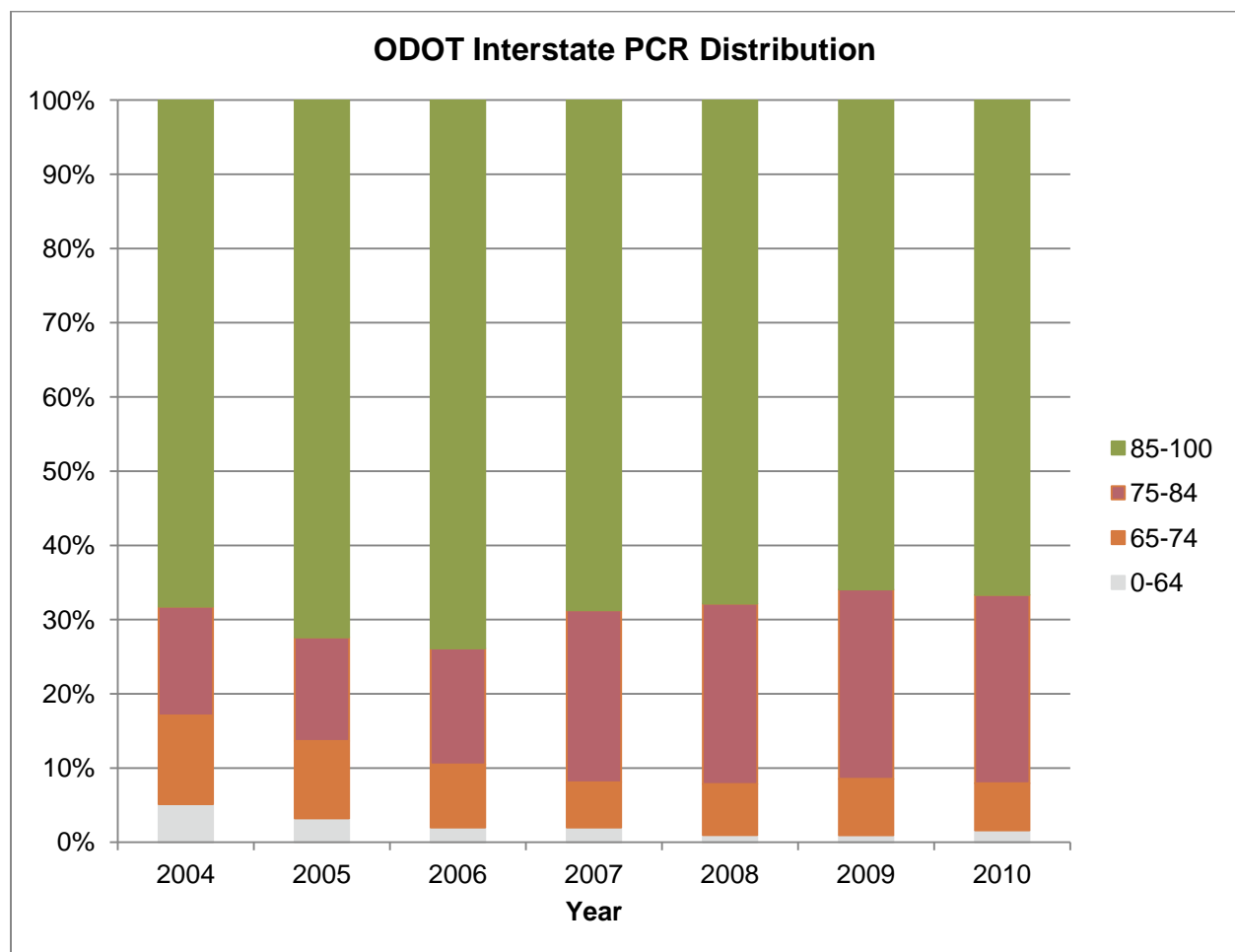
The Ohio Turnpike pavement has been very well maintained over its life. OTC maintenance staff regularly performs preventive and reactive maintenance, including crack sealing, surface patching, partial and full depth repairs, and drainage maintenance.

The OTC completed a resurfacing program of its pavement between 1967 and 1972. Since that time, the OTC has maintained a pavement resurfacing program of 25 to 35 centerline miles per year, including overlays and mill-and-fill treatments ranging from 1.25 to 3.5 inches in thickness. For some of these treatments, more material was added than removed, resulting in a more robust pavement structure. By now, nearly the entire Turnpike pavement has gone through four maintenance cycles (resurfacing or mill-and-fill projects) and some sections have had a fifth treatment. The average treatment cycle is 10 years.

Ohio Turnpike Pavement Conditions compared to ODOT

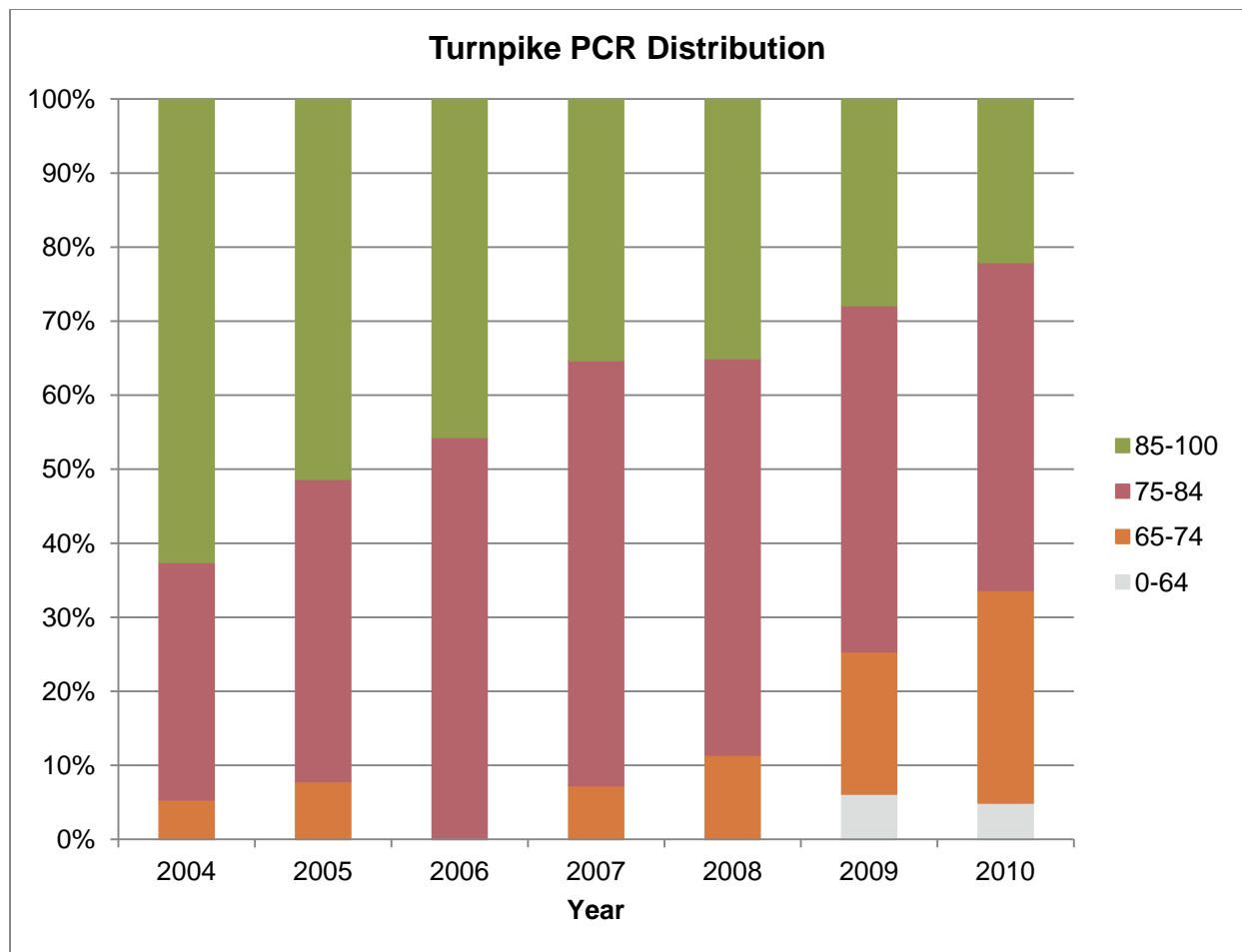
ODOT manages its pavement inventory using PCR data, which is used to establish pavement condition goals, calibrate funding, and provide a trigger for intervention of individual pavement sections. PCR is a visual inspection of the condition of the pavement by trained raters. The rater catalogs pavement distresses in terms of severity and extent, assigns a deduct to each distress, and subtracts the sum of the deducts from 100. A pavement in perfect condition receives a PCR of 100. Structural Deduct (“SD”) is contained within the PCR, but indicates those distresses which may be related to the structural integrity of the pavement. A structural deduct of 25 or more indicates the pavement section should be considered for major rehabilitation (e.g., full-depth reconstruction). ODOT’s goal is for 95% of its pavement to have a PCR rating of at least 65.

The pavement inventory can be stratified by “bandwidths” to provide a graphic of overall conditions and trends. PCR bandwidth ranges are 85 – 100 (excellent); 75 – 84 (good); 65 – 74 (fair); and 0 – 64 (poor). The figure below shows the PCR distribution of all ODOT Interstate Highway pavement, 2004 to 2010.



This graphic provides an example of overall stability in a pavement inventory. There is a very low percentage of poor pavement, and the percentage of pavement in “fair” condition – PCR 65 – 74 – shows slight decline over the period.

The same analysis of PCR data is shown below for the Ohio Turnpike pavement inventory. The Turnpike shows a slight increase in the percentage of “fair” condition pavement (PCR 65 – 74) with corresponding reductions in the inventory of better pavements.



There can be numerous reasons for this decline in Turnpike pavement condition over time. Since the Turnpike's pavement inventory is relatively small in comparison to ODOT, small reductions in its pavement resurfacing program can have dramatic impacts.

But another reason is the performance of the pavement itself – i.e., how well the pavement performs after a resurfacing treatment. When the pavement structure is in good condition, resurfaced pavement will remain in good condition for 12 to 18 years. If the pavement structure is failing, a resurfacing treatment will degrade at a faster rate and not remain in good condition for as long. This is the case for the Ohio Turnpike, because its underlying pavement foundation is 58 years old. The age of the Turnpike's original pavement, and its declining performance over time, led the OTC to sponsor a comprehensive pavement study and master plan for full depth reconstruction of its pavement.

Ohio Turnpike Pavement Master Plan

In spite of a good maintenance program, there is deterioration of the concrete base of the Turnpike pavement. This is common to pavement built in the 1950s, as materials specifications were not as advanced as today, chemical additives to PCC and asphalt concrete mixes were not the norm, and under drain systems were not as advanced in their design. As a consequence of the base pavement deterioration, cracks and voids in the base propagate through the riding surface of the pavement. This causes faster degradation of the asphalt pavement, reducing ride quality and requiring more-frequent overlays or mill-and-fill treatments. From a capital expenditure standpoint, it becomes more expensive to do frequent resurfacing than to replace the pavement in its entirety.

The OTC Pavement Master Plan evaluated the existing condition of the original concrete pavement, made recommendations for its reconstruction, and prioritized construction phases based on the severity of its condition. The Master Plan took the following data into consideration:

- Pavement history and condition data;
- Measurement of transverse cross slope, rutting, and transverse joint faulting of the traffic lanes;
- Ground Penetrating Radar readings of concrete structure condition;
- Falling Weight Deflectometer readings of pavement strength;
- Geotechnical analysis of soil conditions; and
- Core Samples.

The Master Plan concluded that full depth reconstruction of the Turnpike's original pavement would provide the lowest lifecycle cost for the ongoing maintenance of the facility. In other words, while full depth reconstruction is more expensive than surface maintenance treatments, over the long term, the new pavement would require fewer maintenance interventions and therefore be less expensive to maintain.

The Master Plan was reviewed with staff from the ODOT Office of Pavement Engineering. ODOT staff agreed with the methodology and findings of the report. Informally, ODOT staff indicated that the worst section of Turnpike pavement was worse than any ODOT freeway pavement and would therefore rank highly as a candidate for ODOT's major pavement rehabilitation program (ODOT has been rebuilding freeway pavement for a number of years, with a specific program budget for such projects). Parsons Brinckerhoff engineers also reviewed the report data and concurred with its findings.

The Master Plan divided the Turnpike (241.2 centerline miles) into five centerline-mile long sections, except the last 1.2-mile long segment, producing a total of 48 sections. The Master Plan ranked each of 48 sections based on the severity of the pavement deficiencies. This plan formed the basis of the capital expense forecast for the Status Quo with Increased Bonding Capacity, Public Option and Public-Private Option.

Pavement Condition Forecast Model

Under any option, it was assumed that full depth pavement replacement would occur over a number of years due to funding availability, maintenance of traffic, current pavement conditions, or some combination of all these factors. Since full depth construction projects are phased, there are still requirements to maintain the surface conditions of the remainder of the Turnpike pavement via resurfacing and mill-and-fill projects.

The number of these pavement maintenance projects was based on ODOT PCR goals. A simple model was constructed for the 48 sections of the Turnpike developed in the Master Plan. Full depth reconstruction projects were input to the model (for each of the three options as described below), and conditions for the remaining Turnpike pavement were forecast based on the section's current PCR rating, degraded by 3 PCR points per year. Pavement maintenance projects were then slotted into the model at a frequency to meet ODOT PCR goals – i.e., 95 percent of the Turnpike's pavement inventory would have a PCR of 65 or greater. The pavement condition forecast model provided a schedule for routine pavement treatments that would supplement the full-depth reconstruction program.

Pavement Scenario Assumptions

While the OTC is using the Master Plan as a guide to its capital program, there is some ambiguity as to a long range (greater than 20 years) OTC pavement replacement program. At least initially, the OTC is planning one full depth reconstruction project per year (one 5 centerline mile section), prioritized based on the Master Plan. This pace of full depth pavement reconstruction appears to be based both on need and funding availability. One project was completed in 2011, and a second project will be completed in 2012. For the Status Quo with Increased Bonding Capacity, it was assumed that the Turnpike would replace one segment of pavement per year for the next 46 years, supplemented by routine pavement resurfacing projects.

The public pavement option made a slightly different assumption with regard to reconstruction. ODOT has a freeway pavement reconstruction program, and annually develops and ranks a number of “candidate” projects for full depth reconstruction based on their condition and performance history. For the Public Option, the approach was to compare the Turnpike’s pavement to ODOT freeways in terms of “candidates” for full depth reconstruction. By this approach, it was estimated that (based on the OTC Pavement Master Plan) ODOT would prioritize two Turnpike segments per year for full depth reconstruction. Thus it was assumed that ODOT would complete Turnpike pavement replacement in 23 years, supplemented by routine pavement resurfacing projects.

The Public-Private Option takes a slightly different approach to the full depth pavement replacement projects. The Public-Private Option was driven by two factors:

1. “Smoothing” overall capital expenditures between structures, pavement and other capital costs.
2. Scheduling full depth pavement replacement projects in such a way as to minimize the net present value of the cost of these projects.

Accordingly, in the Public-Private Option it was assumed there would be no full depth pavement replacement projects within the first nine years. The pavement condition forecast model was used to predict the number of resurfacing projects in the first nine years that will be necessary to maintain acceptable PCR ratings within ODOT goals. After the first nine years, the Public-Private Option assumes that there will be three full depth reconstruction projects per year from 2022 – 2031, then two projects per year from 2032 – 2039, at which point all the original pavement will have been replaced.

Comparing the three options:

- In the Status Quo with Increased Bonding Capacity, the pavement replacement program will be completed in 2058, at which point the last segments rebuilt will be over 100 years old;
- In the Public Option, the pavement replacement program will be completed in 2035, at which point the last segment rebuilt will be 80 years old;
- In the Public-Private Option, the pavement replacement program will be completed in 2039, at which point the last segments rebuilt will be 84 years old.

Pavement Capital Expenditure Inputs

In addition to the pavement replacement and maintenance program for the original lanes, a capital cost forecast was also completed for the Turnpike’s newer pavement – the additional lane and shoulder between milepost 59 and 218. This pavement is constructed of full depth asphalt, and built between 1995 and the 2010. At the end of the 50 year concession period, this pavement lane will be a maximum of 67 years old. Full depth reconstruction was not programmed for these newer pavement segments, but resurfacing projects were assumed, again based on the forecast to meet ODOT pavement goals.

Costs for full pavement replacement, overlay with milling, and only overlay were each taken from the last OTC bid for each type of activity. Per lane mile, full-depth pavement replacement is assumed to cost \$1,007,008, overlay with milling is \$251,222 and overlay-only, \$165,150. (These assumptions do include costs for maintenance of traffic and catch basin work, but do not include costs for guardrail, bridge work, or signing and lighting, where those capital costs are captured under roadside assets). The cost for mainline pavement includes pavement costs for ramps.

Aerial maps were used to measure and estimate the size of service plaza ramps, parking lots, and trailer lots. These areas of pavement have an estimated total area of 5,000,000 square feet.

Ramp Repair and Pavement Replacement

There are 31 interchanges on the Turnpike with a total of 93 lane miles. As with most of the Turnpike, these ramps date from the Turnpike's original construction and thus require full depth pavement replacement. The capital forecasting methodology for ramps mirrors the methodology for the mainline Turnpike pavement.

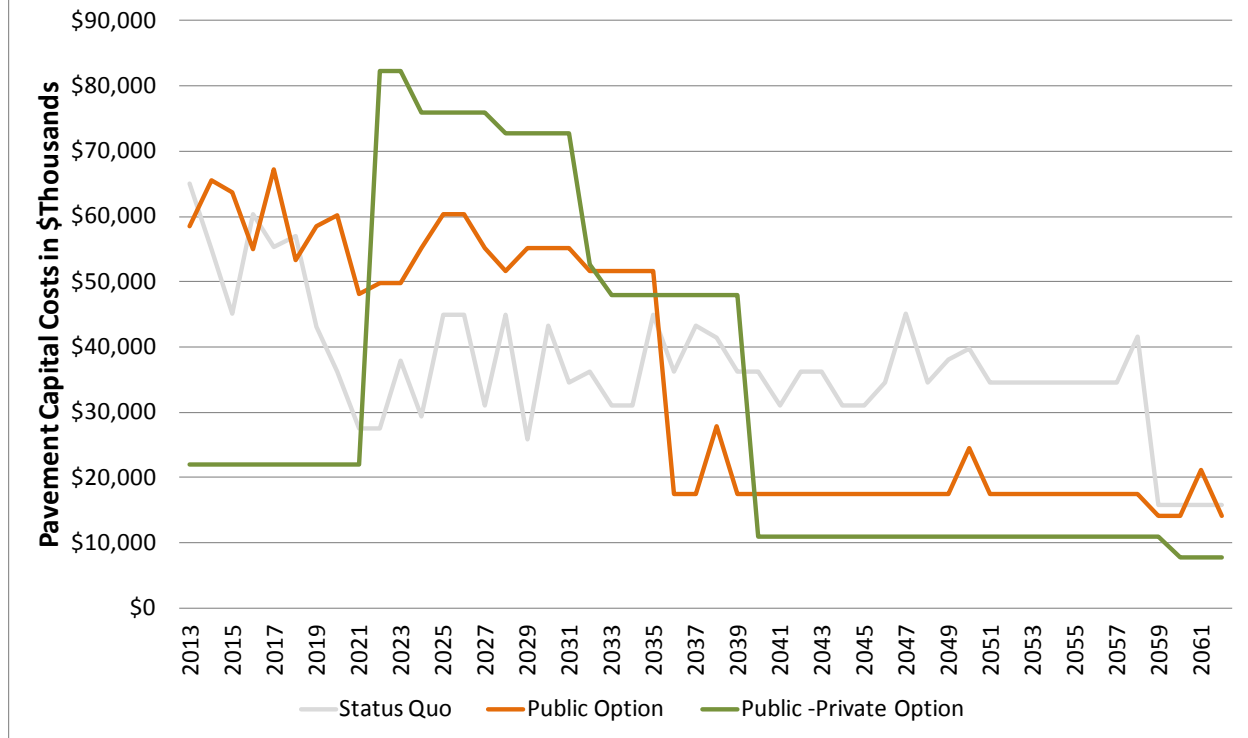
Third Lane

The OTC has plans to add a third lane to some portions of the roadway, scheduled between 2013 and 2018. These costs were included in the capital forecast for the Status Quo with Increased Bonding Capacity. For the Public Option, only the third lane project in 2013-14 was included in the capital forecast due to the advanced state of the engineering plans and public expectations for the project. No third lane projects were included in the Public-Private alternative analysis.

OTC Third Lane Funding Plan

	2013	2014	2015	2016	2017	2018
Third Lane – 59.5-64.1	\$22M	\$10M				
Third Lane – 51.6-59.5				\$19M	\$14M	\$14M

Ohio Turnpike Pavement Capital Cost Forecast



Structures Capital Cost Forecast

There are 328 OTC “mainline” bridges – i.e., bridges that carry the Turnpike travel lanes over roads, railroads, waterways, and other features, and 291 OTC “overhead” bridges – i.e., bridges that carry public roads over the Turnpike.

In accordance with the Ohio Revised Code, the Ohio Turnpike Commission performs an annual inspection of its structures (defined as all bridges 10 feet long in length or greater), per standardized guidelines and “BR-86” forms developed by ODOT. Per state and federal law, ODOT maintains bridge inspection records and summarizes bridge conditions in a database.

Forecasting OTC structures’ capital costs followed these steps:

- field review the inspection reports for the three largest sets of OTC twin bridges, which represent the greatest cost risk for structures capital expenses;
- review a sample of the OTC’s other 619 bridges to verify that the conditions reported on BR-86 forms match standard ODOT inspection practices;
- identify any anomalies or uncertainties in OTC data which could impact the accuracy of a cost forecast;
- With reasonable confidence in inspection data, forecast capital maintenance cycles based on the size, age, and current condition of the structures.

Field Review of Large OTC Structures

There are three sets of large twin bridges (six structures) that received special attention in the process of developing the capital forecast:

- SUM-80-0475: Cuyahoga River Bridge;
- ERI-80-1336: Huron River Bridge;
- LUC-80-1443: Maumee River Bridge.

These structures were reviewed for the Analysis in March, 2012. ODOT provided a “snooper” truck and operator for review of components under the deck, and OTC staff provided safety and traffic control. Approximately four hours was spent reviewing each of the six structures. Thus the field review did not replicate a complete inspection of the structures, but rather a review of major structural components in comparison to the latest BR-86 inspection reports filed by the OTC. Given the nature of an abbreviated field review, attention was primarily given to the summary items for the Deck, Superstructure, Substructure and General Operational Status. In general on the larger structures it was noted that the bridges were typically in better condition than what was listed on the BR-86 forms although no large discrepancies were found.

SUM-80-0475

The table below provides a comparison of BR-86 reports to the field review performed for this study, for the SUM-80-0475 structures over the Cuyahoga River:

SUM-80-0475	BR-86 (dated 2010)	March 2012 Field Review
Deck	7 (Good Condition)	7 (Good Condition)
Superstructure	8 (Very Good Condition)	8 (Very Good Condition)
Substructure	8 (Very Good Condition)	8 (Very Good Condition)
General Appraisal	8 (Very Good Condition)	8 (Very Good Condition)

Field Notes: These structures are less than ten years old. The field review generally confirmed the previous bridge inspection codes which indicate the bridge was rated an overall 8 in the General Appraisal. The only questionable item is the Deck Summary which was rated a 7. In general the deck is in good condition with little to no scaling and no obvious delamination. However, hairline cracks were noted in the deck surface and there were some areas of the top surface of the deck where transverse cracks were observed. Stay in place forms on the bottom of the deck prevented observation although the forms showed no deterioration. A different inspection crew could conceivably rate the deck summary as an 8 but this would have no impact on the General Appraisal, and if anything, shows a slightly conservative bias about the condition of the structures. Severe erosion was noted at the eastern abutment on the south side slopes that should be addressed with drainage maintenance improvements.

ERI-80-1336

For the Huron River Bridges (ERI-80-1336) the existing bridge inspection reports (dated 2010) indicated the following summary codes, compared to the 2012 field review completed for this study:

ERI-80-1336	BR-86 (dated 2010)	March 2012 Field Review
Deck	7 (Good Condition)	7 (Good Condition)
Superstructure	7 (Good Condition)	8 (Very Good Condition)
Substructure	7 (Good Condition)	7 (Good Condition)
General Appraisal	7 (Good Condition)	8 (Very Good Condition)

Field Notes: This is an older structure that was recently widened and rehabilitated. The field review generally confirmed the previous bridge inspection codes although it was the opinion of the field inspection team that the superstructure summary and general appraisal could be upgraded to an 8 rather than the 7 shown on the BR-86 forms. There were obvious areas on the deck surface where there were recent repairs, cracks and deteriorations but the underside of the deck shows no damage. In general the beams and substructures for this bridge appear to be in very good condition. Again, the BR-86 forms on file with ODOT show a slightly conservative bias regarding superstructure and general appraisal, but the difference was not significant enough to impact future cost forecasts.

LUC-80-1443

For the Maumee River Bridges (LUC-80-1443) the existing bridge inspection reports (dated 2010) indicated the following summary codes, compared to the 2012 field review completed for this study:

LUC-80-1443	BR-86 (dated 2010)	March 2012 Field Review
Deck	6 (Good Condition)	7 (Good Condition)
Superstructure	8 (Very Good Condition)	8 (Very Good Condition)
Substructure	6 (Good Condition)	7 (Good Condition)
General Appraisal	6 (Good Condition)	7 (Good Condition)

Field Notes: Again, this is an older structure that was recently widened and rehabilitated with the superstructure completely replaced. The field review confirmed the previous bridge inspection codes for the superstructure summary, however it was the opinion of the field inspection team that the deck summary, substructure summary and general appraisal could all be upgraded to 7's rather than 6's as shown on the BR-86 forms. There were two bolts missing from the keeper plate on the north beam near the hinge but otherwise the steel was in very good condition. Piers in the river were visually examined from a distance with binoculars but in general all looked to be in good condition with little to no cracks or spalling, with previous repairs performing well. The deck was poured with stay in place forms so the bottom of the deck could not be examined. Pans appeared to show no deteriorated areas.

Summary of Large Structure Field Reviews

Given approximately four hours of review per structure, the field reviews of the largest Turnpike bridges found no extraordinary deviation from the BR-86 inspection reports filed by the OTC. In a few instances where there was a deviation, it was always toward a more conservative evaluation of the structure's condition – i.e., the structure component was better than that listed on the BR-86 form. This was especially true of the LUC-80-1443 structures over the Maumee River. However, the differences in bridge ratings were minor and immaterial to cost forecasting.

Sample Inspection of 10 OTC Structures

In addition to the three large twin structures reviewed above, ODOT conducted a similar review of 10 OTC bridges which were of average size and located in ODOT districts 2, 3, and 12 to provide a wider geographic sample. The bridge conditions were reviewed by ODOT district bridge inspectors, and compared to the BR-86 inspection reports which were prepared for OTC by a third party consultant. There were two primary purposes for this ODOT evaluation:

1. to verify that the inspections of OTC structures were carried out according to ODOT inspection guidelines for rating bridge components – in other words, to ensure that a bridge rated an “8” by the OTC would receive the same rating if evaluated by ODOT staff;
2. based on the verification of OTC bridge ratings, determine the appropriateness of using OTC ratings as a basis for estimating remaining service life and capital costs.

While only 10 structures were reviewed (less than 2% of Turnpike structures), there was a variation in the ratings for two of these bridges. In addition, ODOT staff noted that some details of BR-86 reports contained erroneous data in regard to bridge inventory. The bridges reviewed and their ratings in comparison to ODOT review are:

- Wood County, SFN 8729522: Rated 7 for general appraisal, confirmed by ODOT review
- Wood County, SFN 8729530: Rated 7, for general appraisal, confirmed by ODOT review
- Wood County, SFN 8729549: Rated 7 for general appraisal, confirmed by ODOT review
- Lorain County, SFN 4729463: Rated 6 for general appraisal, ODOT would rate lower (3/4)
- Lorain County, SFN 4729811: Rated 5 for general appraisal, confirmed by ODOT review
- Lorain County, SFN 4729927: Rated 4 for general appraisal, ODOT would rate higher (6)
- Cuyahoga County, SFN 1829521: Rated 6 for general appraisal, confirmed by ODOT review
- Cuyahoga County, SFN 1829548: Rated 6 for general appraisal, confirmed by ODOT review
- Cuyahoga County, SFN 1829726: Rated 6 for general appraisal, confirmed by ODOT review
- Cuyahoga County, SFN 1829785: Rated 6 for general appraisal, confirmed by ODOT review

Even though the sample size was very small, due to the variation between ODOT and OTC inspection results, it was decided to develop a capital forecast primarily based on the age of the bridges, rather than to calculate remaining service life from condition ratings. The forecast methodology is provided below.

Additional Review of Structures with Original Decks

The final field review involved an evaluation of approximately 55 bridges, for which the bridge inventory indicated original decks – i.e., in 58 years since the Turnpike was built, inventory records indicated these bridges had not had any deck work performed – no wearing surface overlays, and no deck replacement. While 58 year old bridge decks are not unheard of, it was deemed prudent to perform a field review to verify the inventory data (were the bridge decks actually 58 years old) and condition, which was relatively good.

Most of these bridges were located in the western third of the Turnpike (west of Toledo), and nearly all of those were overhead structures. Engineering staff drove the Turnpike and stopped beneath these structures to verify the age of the decks and their general condition. The review confirmed not only the age of the bridge decks, which were indeed original to the Turnpike's construction, but also their relatively good condition as noted in OTC inspection records.

Structures Capital Forecasting Methodology

To forecast capital costs for OTC structures, a framework was developed which used the age of the bridges and their major components (e.g., bridge decks) to create a capital replacement cycle and forecast of capital maintenance requirements.

Once developed, the master bridge maintenance framework provided a way to standardize bridge maintenance activities. The framework allowed for the consistent application of three key maintenance activities to the Turnpike's large portfolio of bridges that vary in terms of age, structure type, and condition. There are three key activities in the framework each with twenty year intervals in between – wearing surface replacement, bridge deck replacement, and superstructure replacement. The three groups of activities are defined by task here with the unit costs used in the model.

Wearing surface replacement – The table below shows the unit costs for each element included in wearing surface replacement.

Wearing Surface Replacement Unit Costs:

Task	Unit Cost
Surface Preparation using Hydro demolition	\$55 per SQ YD
Misc. Overlays < 4,000 Sq Ft	\$45 per SQ YD
Misc. Overlays > 4,000 Sq Ft	\$40 per SQ YD

Bridge deck replacement – The table below shows the unit costs for each element included in deck replacement.

Deck Replacement Only Unit Costs:

Task	Unit Cost
Existing Deck Removal	\$12 per Sq Ft
New Deck on Existing Beams (Under 4,000 Sq Ft)	\$45 per Sq Ft
New Deck on Existing Beams (Over 4,000 Sq Ft)	\$40 per Sq Ft

Task	Unit Cost
Replacement of Concrete Railing	\$140 per Lin. Ft
Approach Slab Replacement	\$225 per Sq Yd
Painting of Structural Steel	\$16 per Sq Ft of Steel

Superstructure replacement – This includes the replacement of up to 50% of the substructure, painting of structural steel, replacement of railings and approach slabs will occur when bridge decks are replaced or as part of superstructure replacement. The table below shows the unit costs for each element included in bridge replacement.

Bridge Replacement including replacement of 50% of Substructure Unit Costs:

Task	Unit Cost
Existing Bridge Removal	\$13 (1/2 of bridges at \$12 and ½ at \$14 per sq ft of deck)
Structure Replacement	\$100 (1/2 of bridges at \$60 and ½ at \$125 per sq ft of deck + 10% FOR MISC EXTRAS)
Replacement of Concrete Railing	\$140 per Lin. Ft
Approach Slab Replacement	\$225 per Sq Yd

Bridge maintenance activities from the framework were then used to produce a schedule for each bridge. The Ohio Turnpike Commission bridge inventory was used to gather the age of the bridge decks and wearing surfaces. These factors were then used to determine the next activity each bridge would need and when it would be needed. Bridges were aggregated into groups of five year intervals. In this way every five years of the evaluation period a different group of bridges begin their maintenance cycle. The table below shows the number of mainline and overhead structures that enter each five-year cycle.

Number of Bridges Entering Standard Cycle by Year:

Enter Cycle	Mainline	Overhead
Years 1-5	61	63
Years 6 -10	44	41
Years 11-15	68	52
Years 16-20	108	81
Years 21-25	43	40
Years 26-30	4	14
Total	328	291

For bridges that did not fit into the framework, engineers used judgment to schedule capital maintenance on a cycle that would ensure safety and conform to ODOT condition goals.

- Bridges with decks less than twenty years old were placed on the maintenance cycles to have a wearing surface replacement when they reached twenty years and then the following cycle would be the deck replacement after another 20 years, then another wearing surface after 20 years.
- The bridge decks older than twenty years were kept on the same cycle as above except that the first wearing surface cycle was not skipped.
- For the 55 bridges with original decks and wearing surfaces, the rating from the inventory was used to calculate the time until the next deck replacement for each. These bridges were then assigned to the proper five-year span according to the framework above.

Culverts

The OTC provided inventory data for its culverts, which contained the diameter of the culverts and their location. The inventory did not list the length of the culverts, so an average length was estimated to be 180 feet per culvert, which was based on aerial mapping data. The OTC inventory did not list any year of construction or replacement, so all culverts were estimated to be original to the Turnpike. Culverts are estimated to have an 80-year design life, which means all would need to be replaced over the 50 year analysis period.

The OTC's culvert inventory shows a total of 320 culverts, of which 250 are 60 inches or less in diameter. To forecast costs, the inventory was bifurcated between culverts of greater or less diameter of 60 inches, with the following inputs

Costs for Culverts 60" and less

- \$350 per ft. for Culvert replacement;
- \$25 per ft. removal of existing Culvert;
- \$25 per ft. for Headwalls and miscellaneous costs;
- \$400 per ft. total.

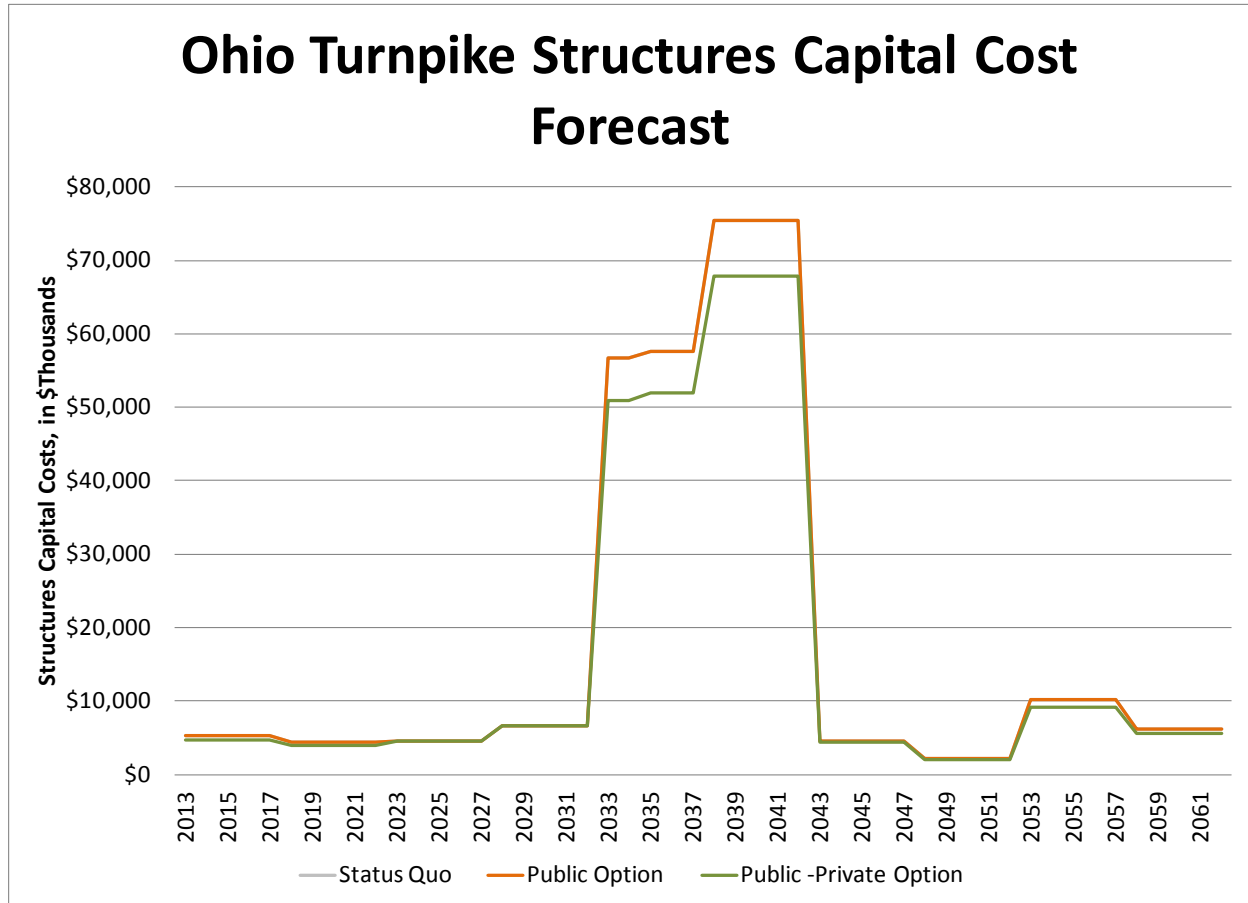
Costs for Culverts over 60"

- \$900 per ft. for Culvert Replacement;
- \$50 per ft. removal of Existing Culvert;
- \$50 Per ft. for Headwalls and miscellaneous costs;
- \$1000 per ft. total.

There was no detail in the OTC inventory on culvert condition. In the absence of data, it was assumed that all culverts would be replaced during the 50 year analysis period. Since culvert failure is unpredictable, it was estimated that an even number of culverts would require replacement between 2035 and 2065 – the capital cost forecast for culverts, then, is based on replacing eight culverts of 60 inches or less per year from 2035 on, and two culverts with diameters greater than 60 inches, again from 2035 on.

Structures Capital Cost Forecast

The same assumptions of capital needs were made for the three options. The Public-Private Option calculated a 10 percent cost savings due to procurement efficiencies.



Roadside Capital Cost

Roadside capital costs includes guardrail, barrier, lighting, signs, fencing and other appurtenances within the right-of-way.

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Assumptions	Roadside capital costs are assumed to be the same for all three options	Roadside capital costs are assumed to be the same as OTC.	Same basis for asset condition and replacement cycles, with 10 percent discount for public-private procurement efficiencies.

Guardrail

Guardrail costs include rail, posts, and impact attenuators. Current Turnpike guardrail and impact attenuators conform to NCHRP 350 crash standards. The Turnpike does not have an inventory of its guardrail. To estimate total existing guardrail a sampling of 10 mile sections of the Turnpike was measured in both the eastbound and westbound directions in both the four-lane and six-lane sections. Samples included both mainline and ramps. These measured lengths of guardrail were then applied across similar sections for the entire length to arrive at an estimated total length of existing guardrail. Annual average guardrail cost was estimated to be \$168,300. Guardrail costs do not include the cost of guardrail damaged in crashes and recovered from insurance companies.

High Mast Lighting and Poles

Visual aids, such as aerial photos and the Pathweb Videolog provided by ODOT, were used to count the number of high mast lighting unites. Analysis results indicate approximately 472 existing high mast light poles along the entire length of the Turnpike including toll and other facilities. Based on historical pricing data from ODOT, high mast lighting was estimated to have an average annual replacement cost of \$80,712.

Low Mast Lighting and Poles

As with the high mast lighting, aerial photos and the Pathweb Videolog provided by ODOT, were used to count the number of low mast lighting. Analysis indicate approximately and 1,436 low mast light poles along the entire length of the Turnpike including toll plazas and other facilities. The age and replacement schedule for these items is not known. Based on historical pricing data from ODOT, the average annual cost for roadside lighting was estimated at \$64,620.

Right of Way Fence and Gates

The R/W Fence along the Turnpike has been largely replaced since 1987 with nearly 91% or 439 miles completed. A cost of \$5/ft was assumed for this work. An annual cost of \$135,500 was assumed for right of way fence and gates.

Delineator

An annual cost of \$119,520 was assumed for highway delineator. This cost came from Turnpike historical records.

Noise Walls

There are two existing Noise Barriers constructed along the Ohio Turnpike. They are both approximately 1200 ft long and about 14 – 15 ft tall. One is made of concrete panels and the other of steel post with wood planks.

It is anticipated that there may be a need for future noise studies to be conducted because there is the possibility that several communities or subdivisions along the Turnpike would like to see noise barriers investigated in their proximities. There are approximately 31 areas where there seems to be reasonable possibilities for studying or justifying a noise barrier based solely on dense housing in close proximity to the highway. These areas comprise about 75,600 linear feet of length. Assuming that only 33% of the study length is justified for construction of noise barriers and that the average assumed height is 15 ft., a total square footage of 374,000 was estimated. Based on \$25 per square foot, the potential cost of constructing the walls is \$9,355,500. An assumed cost for study and design is estimated at \$15 per linear foot for a noise study/analysis; and \$15 per linear foot for barrier design and construction plan

development. Based on these assumptions the total cost for all potential noise barriers is approximately \$10,863,500.

Assumed lifespan for the noise barrier is 15 years for the wood, and 40 years for the concrete.

Signs

Ground Mounted Signs: Based on visual inspection, it was estimated that the OTC has 3,100 ground mounted signs, at a square footage per sign of 16 ft², and replacement cycle of 15 years. Annual average cost for ground mounted signs is \$133,920.

Cantilever Mount: It was assumed that the majority of cantilever mount signs were completely replaced when the Turnpike was widened to 6 lanes over the last 12-15 years. In the widened section it was estimated that 19 truss mount sign assemblies need replaced now due to major defects, based on inspection reports. There are 98 other signs in this section that have no major defects and are therefore assumed to have a useful life remaining of 15 years for the sign and 30 years for the supports. In the 4-lane section an estimated 5 cantilever mount sign assemblies need replaced now. The 4-lane portion is older so it was assumed that the cantilever assemblies have half of their lifespan remaining. The remaining 62 cantilever assemblies had no major defects reported and therefore are assumed to have half a full lifespan remaining of 7 years for the sign and 15 years for the supports. The average annual cost was estimated to be \$76,032.

Truss Sign Mount Assembly: It is assumed that the majority of truss mount signs were completely replaced when the Turnpike was widened to 6 lanes 12-15 years ago. In the widened section it was estimated that 16 truss mount sign assemblies need replaced now due to major defects, based on inspection reports. There are 81 other signs in this section that have no major defects and are therefore assumed to have a useful life remaining of 15 years for the sign and 30 years for the supports. In the 4-lane section an estimated 4 truss mount sign assemblies need replaced now. The 4-lane portion is older so it was assumed that the truss assemblies have half of their lifespan remaining. The remaining 51 truss assemblies had no major defects reported and therefore are assumed to have half a full lifespan remaining of 7 years for the sign and 15 years for the supports. The average annual cost was estimated to be \$162,043.

Pavement Marking and Raised Pavement Markers (RPM)

Based on the information provided, the Ohio Turnpike Commission re-stripes the roadway annually. To estimate the quantity of various existing pavement markings, an assumed interchange was measured and then that total applied to similar interchanges/toll/service areas. Then the number of mainline lanes miles was used to estimate totals for the mainline. For the purposes of this analysis, only channelizing lines, edge lines, and lane lines are estimated. Total Cost for Annual Re-striping = \$686,025 (this comports to the low bid for performance of this work for the OTC dated February 3, 2012 which was \$661,000).

Based on calculations of mainline, interchange ramps, and service plaza ramps, there are approximately 31,000 RPMs installed on the Turnpike. Historic Turnpike operating cost records indicate that three percent of RPM's are replaced annually at a cost of \$13,392 – this is exclusive of RPM's replaced as part of pavement projects.

Other Capital Expenses

There are some miscellaneous capital expenses that are identified in the OTC capital budget from 2013 to 2020. Some of these items were retained in the Public and Public-Private Option, as shown in the table below.

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
ITS Projects	Completion of traveler information systems – e.g. dynamic message signs – in the Cleveland and Toledo areas	Same as OTC	Same as OTC
Slope Repairs (Sandusky County overpasses)	Repairs to overpass approach slopes mandated by Ohio General Assembly	Same as OTC	Same as OTC
Design Consultant Services	Annual cost associated with General Engineering Services	Annual cost associated with General Engineering Services	Annual cost associated with General Engineering Services
Misc. Renewal and Replacement Projects	\$6.6 million annually, not defined in OTC budget	Not included	Not included
Fuel Tax Projects	OTC budget identifies \$2M/year in budget in Fuel Tax Projects, without explicit identification	N/A	N/A
Misc. Service Plaza Capital Improvement Projects	\$1 million annually in OTC budget	Not included	Not included

Buildings Capital Cost Forecast

Buildings capital costs includes costs for the Administration Building (in applicable analyses), maintenance outposts, and toll plazas. The table below compares the different assumptions made for this analysis.

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Administration Building	Replaced in 2035	Closed, combined with ODOT District	Closed, Combined with existing maintenance outpost
Toll Plazas	31 locations (62 plazas) replaced every 40 years, \$2M replacement cost	Same as OTC	31 locations (62 plazas) replaced every 40 years, 10% reduction in OTC replacement cost

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Maintenance Outposts	All eight compounds remain in operation in the Status Quo	Only six compounds would be operated in the Public Option; Swanton and Hiram Compounds would be closed	Only six compounds would be operated in the Public-Private Option; Swanton and Hiram Compounds would be closed, 10% reduction in public cost assumption

Administration Building

Capital costs for the OTC Administration Building were calculated based on OTC records, and used in the Status Quo with Increased Bonding Capacity. Neither the Public nor the Public-Private Options assume the continued operation of the OTC Administration Building. It is assumed the Administration Building will need to be replaced in 2035 at a total cost of \$2M.

Toll Plazas

Toll Plaza capital costs were forecast based on OTC records and costs currently budgeted by OTC for Toll Plaza renovation and annual capital maintenance. These costs were extrapolated to the inventory of OTC toll plazas, with cost scaled to each facility based on the number of toll lanes. The annual cost to replace the toll plazas is \$1.6 million for a total of \$78 million in the Public Option analysis, and 10 percent less or \$1.4 million annually or \$70 million total in the Public-Private Option.

Maintenance Outpost Facilities

The OTC has eight maintenance “compounds” located along the length of the roadway. Each of these compounds has buildings for vehicle servicing and repair and general offices. Some facilities also have Ohio State Highway Patrol (general offices and dispatch), which are maintained by the OTC. The compounds also have covered storage facilities for salt and other materials, and various other outbuildings for equipment storage.

In general, an inventory of existing buildings was taken for each maintenance compound and schedules were developed for the full replacement of facilities given existing age and useful life. Repair and refurbishment activities for the facility inventory during their useful lives was developed for periodic replacement of building components such as HVAC and electrical, windows, exterior finishes (including doors), roofing, and plumbing. Repair and refurbishment costs for each facility were determined and average annual costs were determined for each activity and facility.

Operational analysis indicated that two fewer compounds would be needed if ODOT or a Concessionaire maintained the Turnpike. The costs for the Public Option and Public-Private Option include the replacement and average annual repair and refurbishment costs developed for the facilities assumed to remain in operation.

Total Equipment Replacement Costs

To forecast equipment costs, the entire inventory of OTC vehicles and equipment was analyzed to calculate remaining useful life and replacement cost. The Status Quo with Increased Bonding Capacity assumed that the current inventory of equipment would also be used in the future. The Public Option

developed equipment inventory based on ODOT maintenance practices. The Public-Private Option equipment inventory was assumed to be the same as ODOT. The other variable in calculation was the average replacement cycle policy assumed for the three options. Summary:

	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Equipment Inventory	Based on current OTC equipment inventory	Equipment requirements were developed based on ODOT maintenance practices	Same as Public Option
Useful Life	7 years	10 years	12 years

Equipment Assumed for Public and Public-Private Option

Equipment	Number
SNOW AND ICE TRUCKS	97
SALT CONVEYORS	4
TOW PLOWS	8
LOADERS	20
MESSAGE BOARDS	12
CRASH ATTENUATORS	18
ROLLERS	8
CRACK SEALERS	3
CARS	9
VANS	6
LIGHT TRAILERS	24
CHIPPERS	4
BOBCATS	6
SIGN TRUCKS	6
TRAFFIC CONTROL TRUCKS	6
SEWER CLEANERS	2
PICKUPS	36
HEAVY TRAILERS	18
AIR COMPRESSORS	10
LIGHT TOWERS	18
CONCRETE SAWS	6
RIDING MOWERS	6
ARROW BOARDS	24
BACKHOES	6
SWEEPERS	3

Tolling Equipment Capital Costs

Electronic toll collection systems use a radio receiver in toll lanes to communicate with transponders mounted on driver's windshields to record transactions and debit a pre-paid customer account. Such systems dramatically reduce operations costs through a decrease in staffing booths for cash toll collection.

The OTC installed its electronic toll collection system, EZ Pass, in 2009. OTC hired TransCore to install the system and set up a customer service center, and provide ongoing maintenance of the system and software. For this study, a technical review was performed to evaluate the functionality and accuracy of the system using available records, documentation, and inputs from the Ohio Turnpike's management. As with other technical reviews, the intent was to determine any extraordinary issues which would dramatically impact capital cost forecasts.

OTC E-ZPass System Evaluation

The technical review found that the OTC system is being maintained at a level above the contractual Minimum Required Accuracy Rate for most performance measures, with the exception of the E-ZPass® system. While the E-ZPass® system passed the minimum accuracy rate of 99.5% during testing, according to data obtained from the OTC, the E-ZPass® system operated at a rate of 99.2% for the months of March and April 2012. OTC has found that the root cause of this shortfall is most often customer behavior (e.g., improper mounting of the E-ZPass® transponder) rather than equipment error or system malfunction.

System availability has been consistently above contractual requirements due to overall system reliability and effective system maintenance, when needed. Preventive, corrective and emergency maintenance is being performed in a timely manner in accordance with the contractual requirements for repair. It appears that OTC and TransCore are working closely together in an effective manner to identify system problems and maintain the overall performance of the OTC system.

Overall, the Ohio Turnpike Commission operates a robust tolling system. The system works well and is consistent with industry standards. Given the same level of effort, it is expected that the system will continue to perform at the same levels of accuracy and reliability as currently being experienced.

Toll Collection System Capital Cost Forecast

To develop a capital cost forecast for the OTC toll collection system, system components were inventoried and costs recorded based on bid documentation. The table below shows the cost components for the lane equipment, hardware, software and other miscellaneous costs.

E-ZPass System Cost Components	Quantity	Unit	Cost
E-ZPass Equipment	230	Lane	\$ 1,610,000
Lane Controllers	230	Each	\$ 2,300,000
DATIM's	97	Lane	\$ 3,007,000
Entry Lane Equipment (i.e., Overheight Sensors, Vehicle Separators, Scale Interface, Cabling, Loops, Treadles, Etc.)	97	Lane	\$ 1,746,000
ATPM's	21	Each	\$ 1,974,000

E-ZPass System Cost Components	Quantity	Unit	Cost
Exit Lane Equipment (i.e., Contact Treadles, Vehicle Detector Loops, etc.)	133	Lane	\$ 1,596,000
Exit Toll Booth Equipment (i.e., Debit/Credit Card Readers, Employee ID Badge Readers, Exit Ticket Transports, Fare Displays, Toll Collector Interfaces, Receipt Printers, etc.)	133	Lane	\$ 2,926,000
VES Hardware and Software	1	Lane	\$ 27,000
Camera Surveillance System	1	Lump Sum	\$ 1,142,000
Batch Ticket Machines	3	Each	\$ 363,000
Toll Ticket Certifiers	2	Each	\$ 48,000
Computer Equipment (Servers, Peripheral Equipment, Storage, etc.)	1	Lump Sum	\$ 414,000
Communications Interface	1	Lump Sum	\$ 170,000
Software	1	Lump Sum	\$ 2,016,000
Testing	1	Lump Sum	\$ 733,000
1-Year TCS Warranty	1	Lump Sum	\$ 2,042,000
TCS Equipment Installation	1	Lump Sum	\$ 1,721,000
TCS Spares	1	Lump Sum	\$ 784,000
TCS PM	1	Lump Sum	\$ 960,000

There is also a significant cost to establishing back office operations and customer service center. These are shown in the next table:

E-ZPass Back Office Cost Components	Quantity	Unit	Cost
Computer Equipment (Servers, Peripheral Equipment, Storage, etc.)	1	Lump Sum	\$ 236,000
Communications Interface	1	Lump Sum	\$ 420,000
Software	1	Lump Sum	\$ 505,000
Testing	1	Lump Sum	\$ 139,000
1-Year CSC Warranty	1	Lump Sum	\$ 425,000
CSC Equipment Installation	1	Lump Sum	\$ 420,000

CSC Spares	1	Lump Sum	\$ 109,000
CSC PM	1	Lump Sum	\$ 320,000
Other/Misc	1	Lump Sum	\$ 3,000

Based on industry standards for electronic toll collection and other hardware and software components, average lifecycle is estimated to be eight years. However capital cost requirements are not spread evenly over such a cycle – typically components fail at an increasing rate until replacement at the end of their lifecycle. And, there are a number of upgrades to some system components required prior to the end of their service life, necessitated by compatibility issues, software changes, and other factors. Therefore, rather than simply assuming a system replacement cycle every eight years, the toll collection system capital cost forecast assumed an average annual replacement cost of \$3.52 million annually.

Service Plaza Analysis

Parsons Brinckerhoff analyzed the long-term financial performance of the service plaza operation under two scenarios:

- Status Quo with Increased Bonding Capacity and Public Option, which assume OTC service plaza management practices continue with no cross subsidies from toll revenues;
- Public-Private Option, which assumes the service plazas are part of an overall Turnpike Concession.

The analysis resulted in forecast revenue, operations and maintenance cost, and capital maintenance costs which were used in the overall financial analysis of the monetization options described above

Service Plaza Assets

The Turnpike has a total of 16 service plazas, configured in pairs at eight separate interchanges that average approximately 30 miles apart over the length of the road. The OTC began replacing the original service plazas, which were built in the 1950s, beginning in 1998. As of the date of this analysis, 12 of the original service plazas had been replaced and the remaining four were closed for reconstruction.

The eight pairs of service plazas are detailed in the following table. In each case, the services and amenities listed for a pair of service plazas are located at each eastbound and westbound plaza in the pair. The OTC also has a single contract with Sunoco to provide fuel at all 16 service plazas.

OTC Service Plazas, 2012³⁰

Mile-post	Name (Eastbound /Westbound)	Food Services	Other Services
20.8	Tiffin River/Indian Meadow	Burger King, Sbarro, Starbucks	Convenience store, truck stop electrification
49	Fallen Timbers/Oak Openings	NA – closed for reconstruction	NA

³⁰ Ohio Turnpike Commission.

Mile-post	Name (Eastbound /Westbound)	Food Services	Other Services
76.9	Wyandot/Blue Heron	Gloria Jean's Coffees, Hardees, Mancino's Italian Eatery, Red Burrito	Traveler's Express, picnic area, RV overnight parking
100	Commodore Perry/Erie Islands	Burger King, Cinnabon/Carvel, Einstein Bros. Bagels, Sbarro, Starbucks	Travel Mart, picnic area
139.5	Vermilion Valley/Middle Ridge	Burger King, Great Steak & Potato, Hershey's Ice Cream, Manchu Wok, Panera Bread, Popeye's, Starbucks	Travel Mart, picnic area, RV overnight parking, community room
170.1	Towpath/Great Lakes	Burger King, Panera Bread, Pizza Hut Express/KFC, Starbucks	Travel Mart, picnic area
197	Brady's Leap/Portage	McDonald's, Sbarro, Starbucks	Travel Mart/Ohio Marketplace, picnic area, RV overnight parking
237.2	Glacier Hills/Mahoning Valley	<i>NA – closed for reconstruction</i>	<i>NA</i>

Most service plazas include truck power hook ups, a picnic area and Travel Mart, which offers travelers basic automobile supplies and parts, and all plazas include a welcome desk, ATMs, gift shops, pet walking areas, restrooms, and other amenities.

Historical OTC Operating Revenue and Expenses

The OTC manages numerous short term vendor contracts with several service plaza operators providing fuel, food and beverage, and many other services. In exchange for the rights to operate at the service plazas, the OTC typically receives a contractually agreed upon share of gross sales in addition to other fees related to capital improvements, property management, and common area maintenance ("CAM"). As of 2010, this share of sales and additional fees yielded gross service plaza revenue of \$11.9 million and represented 5 percent of total OTC revenue.

OTC service plaza expenses consist of the following:

- Maintenance, including parking areas, utilities, underground fuel equipment, physical plant, buildings, and snow plowing;
- Engineering, including design, renovation, and plan approval; and
- Service plaza operations, including customer service and contract management.

Historically, net OTC revenue from the various operator contracts has totaled approximately \$12 million per year while expenses have ranged from \$6.9 million up to \$7.6 million.

OTC Historical Service Plaza Operating Performance³¹

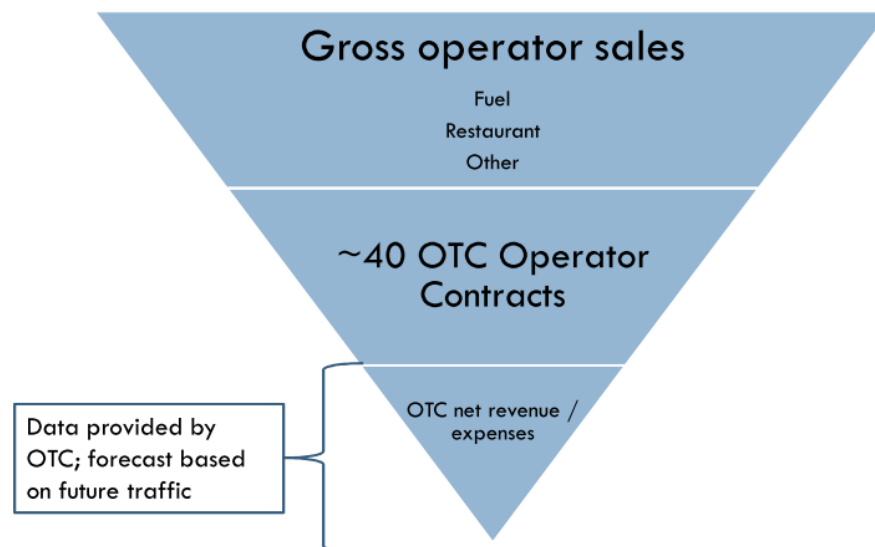
	2007	2008	2009	2010
Total Revenue	\$12.2m	\$11.8m	\$11.8m	\$11.9m
Total Expense	\$6.9m	\$7.3m	\$7.1m	\$7.6m
Net Income	\$5.3m	\$4.5m	\$4.8m	\$4.3m

Status Quo with Increased Bonding Capacity and Public Option: Continued OTC management practices

In the Status Quo with Increased Bonding Capacity and the Public Option, it is assumed that the OTC continues to manage the service plaza operation, with no change in operational performance, vendor contracts, and strategy.

Status Quo with Increased Bonding Capacity and Public Option

Service Plaza Operating Forecast Methodology Overview



Status Quo with Increased Bonding Capacity and Public Option – Operating Revenue Forecast

Forecast revenue by service plaza was based upon the actual service plaza gross revenue to the OTC for 2010 which was grown in line with the traffic estimate for the forecast period. These revenues to the OTC represent lease payments (typically a percentage of gross sales) from vendors as specified in each vendor contract and it was assumed that the revenue growth for each plaza would be directly correlated

³¹ Ohio Turnpike Commission.

to the traffic growth on the relevant section of the Turnpike. The forecast traffic growth rate by segment was applied to each service plaza's 2010 revenue to arrive at a future annual revenue estimate by service plaza. However, as of 2010, two service plazas, Tiffin River and Indian Meadow, were closed and therefore had no gross revenue data from which to draw assumptions. This pair of service plazas was closed permanently for the entire period of available service plaza revenue provided by the OTC, from 2007 through 2010. Furthermore, as of 2010, four of the service plazas had not yet been replaced, and were the original 1950s construction. Historical revenue performance of these dated facilities was far lower than that of the recently rebuilt service areas, which on average were experiencing 2.7 times the annual revenue of the old service plazas still in operation.

After adjusting for observed traffic, on average the reconstructed service plazas generate revenue to the OTC of \$0.143 per vehicle passing the service plaza versus \$0.110 per vehicle for the original service plazas, an increased rate of 30 percent. Thus the forecast for reconstructed service plazas assumed that the Tiffin River/Indian Meadow pair would experience this \$0.143 sales revenue per vehicle, to reflect the typical per vehicle sales potential of a newly constructed facility. For the two pairs that are currently under construction (Fallen Timber/Oak Openings and Glacier Hills/Mahoning Valley), it was assumed that their average OTC revenue per vehicle going forward would experience a 30 percent increase over their 2010 pre-construction capture, which would reflect the increased average per vehicle sales potential of reconstructed facilities versus the original service plazas.

Status Quo with Increased Bonding Capacity and Public Option – Operating Expense Forecast

Total annual administrative overhead was assumed to be \$300,000 based on the previous four years of operating data. For the two pairs of service plazas not yet reconstructed in 2010, the average expenditures from existing reconstructed service plazas were used to reflect the typical performance of new facilities. Expenses represent an average of 62 percent of gross service plaza revenues for reconstructed plazas for the OTC, and this percent was applied to forecast revenue for the four new plazas as well.

2010 Forecast Operating Revenue and Expenses by Service Plaza; assumes all Plazas Operating as New-Construction Facilities

	Revenue	Expenses	Net Revenue
Tiffin River/Indian Meadow	\$1.1m	\$0.73m	\$0.39m
Fallen Timbers/Oak Openings	\$0.9m	\$0.6m	\$0.31m
Glacier Hills/Mahoning Valley	\$1.8m	\$0.95m	\$0.52m
Wyandot/Blue Heron	\$2.1m	\$1.4m	\$0.73m
Commodore Perry/Erie Islands	\$3.3m	\$1.9m	\$1.4m
Vermilion Valley/Middle Ridge	\$2.97m	\$1.7m	\$1.3m
Towpath/Great Lakes	\$1.9m	\$1.45m	\$0.4
Brady's Leap/Portage	\$2.4m	\$1.6m	\$0.8.
Total	\$16.05M	\$10.3m	\$5.8m

Source: OTC, Parsons Brinckerhoff Analysis

Status Quo with Increased Bonding Capacity and Public Option – Capital Expenditures

This scenario assumed that under the Status Quo with Increased Bonding Capacity and the Public Option, the service plazas will be replaced in a method similar to the last OTC replacement cycle, with complete replacement occurring in long-term increments. Each service plaza was assumed to experience a 35-year lifespan, at which point it would need to be replaced or undergo major renovation. Each replacement period was assumed to take one year, based on previous OTC construction experience. At each 35-year replacement, total construction costs were assumed to be \$17.5 million per service plaza, based on OTC's capital plan for new service plaza construction. Currently the OTC funds capital improvements from toll revenues rather than service plaza revenues.

Public-Private Option: Inclusion of Service Plazas in an Overall Turnpike Concession

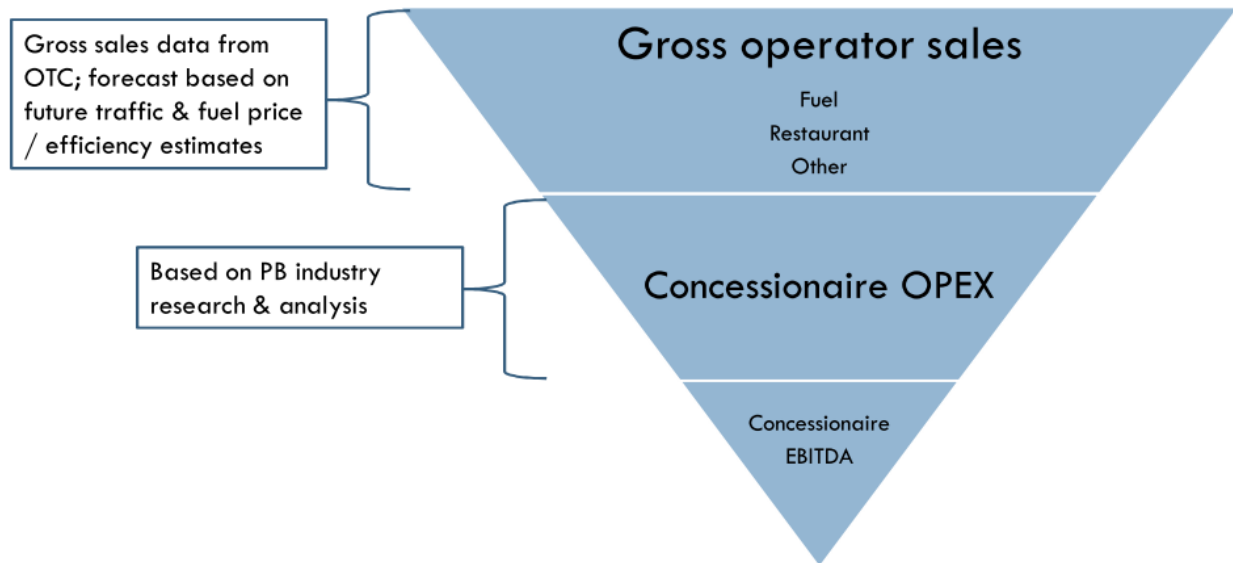
For the Public-Private Option, it was assumed that a Concessionaire would handle all operations and maintenance previously under the responsibility of the OTC and the subcontractors. In this scenario, the previous operator contracts were assumed to be phased out and the Concessionaire would handle all aspects of the service plaza operations to reflect their more active management style and the preference expressed by operators during one-on-one meetings.

Public-Private Option – Operating Revenue and Expense Forecast

Because this scenario was designed to calculate earnings from the perspective of the actual retail and food service operations and did not reflect the OTC's net revenue and expenses from managing numerous contracts, the operating forecast required a different approach. A top-down approach was utilized that began from an estimate of gross operator sales. As such, the following steps were taken to arrive at an estimate of Concessionaire service plaza revenues, operating, maintenance, and capital costs:

1. Gross operator sales data provided by the OTC were forecast based on future traffic scenario forecasts. Fuel prices were estimated based on forecast data from the U.S. Energy Information Administration ("EIA") with an ongoing downward adjustment for increased fuel efficiency in the future. All other revenue categories were assumed to grow in line with traffic growth by scenario.
2. Concessionaire operating expenses were estimated based on research and data from various industry sources including fuel and miscellaneous sales categories from the National Association of Convenience Stores ("NACS") and restaurant expenses based on data from the National Restaurant Association ("NRA").

Public-Private Option- Service Plaza Operating Forecast Methodology Overview



Public-Private Option – Capital Expenditures

The Concessionaire approach assumed that major capital expenditures occur more gradually over time, in more frequent, smaller increments, as opposed to OTC's history of extended periods of minimal improvements followed by complete replacement. This approach was intended to reflect a more frequent refit cycle to keep interiors fresh and to reflect the benefit of more efficient building lifecycle cost management. These improvements were assumed to average \$3 million per service plaza every ten years, with lower capital expenditures in earlier years and higher expenditures in later years as the service plazas age and require higher levels of repair.

Summary of Service Plaza Assumptions by Scenario

	Public Option - Alternative	Public-Private Option
Methodology	Based on OTC net revenue from operator leases for food, fuel and miscellaneous items.	Assumes Concessionaire would manage the service plazas as part of the overall Turnpike lease; CapEx included.
Fuel	N/A – Revenue to OTC from concessions not reported by category.	<ul style="list-style-type: none"> ■ 2011 total gallons sold = 36.4 M ■ Grow proportionally with traffic, including downward adjustment for fuel efficiency (-0.48% p.a.)³² ■ Real fuel price forecast from EIA, averaging 1.5% p.a. real price increase
Restaurant	N/A – Revenue to OTC from concessions not reported by category.	<ul style="list-style-type: none"> ■ 2011 gross revenue = \$52.3 M ■ Grow proportionally with traffic
Other	N/A – Revenue to OTC from concessions not reported by category.	<ul style="list-style-type: none"> ■ 2011 gross revenue = \$13.8 M ■ Grow proportionally with traffic
Annual Total Revenue	<ul style="list-style-type: none"> ■ 2010 State revenue share = \$16.0 M ■ Revenue share grows proportionally with inflation 	N/A
OpEx & CapEx	<ul style="list-style-type: none"> ■ 2010 State OpEx = \$10.3 M ■ Operating costs grow proportionally with inflation ■ \$17.5 M replacement of plazas at 35 years of life 	<ul style="list-style-type: none"> ■ Restaurant EBITDA, before rent = 16.1%³³ ■ Fuel & Other EBITDA, before rent = 3.4%³⁴ ■ \$3 M plaza overhaul every 10 years

³² Energy Information Administration, long-term (1949-2008) average increase in vehicle fuel efficiency.

³³ National Restaurant Association, 2010 Industry Survey Average P&L.

³⁴ National Association for Convenience & Service, 2010 Industry Survey Average P&L.

Rest Area Analysis

As part of the scope of work agreed upon with OBM and ODOT for the Analysis, a high-level assessment of issues and opportunities related to the commercial development of rest areas in the State was performed.

Background

The State operates 104 rest area facilities on the State highway system³⁵.

- Twelve of these locations double as Tourist Information Centers, primarily located at gateways to the state
- The average size of these facilities is about 2,000 square feet, though a new pair of rest areas on I-70 in Licking County are 10,000 square feet each
- Aside from the Tourist Information Centers, most of the facilities offer only automobile and truck parking, picnic areas, toilets and water fountains, and vending machines
- 14 of the rest areas are classified as “primitive,” because they do not include flush toilets
- 45 facilities are located on Interstate Routes, and 59 are located on other US and State routes

Highway rest areas were conceived at the dawn of highway construction itself, with many state highway departments building “roadside parks,” which gave motorists a place to rest during long highway trips. Roadside rest areas were later built as part of the construction of the Interstate Highway System, and were sometimes called “safety rest areas,” offering a place to rest during the longer driving trips associated with interstate highway travel.

The construction of rest areas predated the development of truck stops, gas stations and restaurants at highway interchanges, which is nearly ubiquitous today. Thus, highway travelers today have the option to stop at interchanges for rest breaks, in addition to rest areas.



ODOT spent \$12.9 million to operate and maintain its rest areas in fiscal year 2011, and \$15.6 million for capital improvements. Operations and maintenance funding comes from state gasoline tax revenue, as these expenses are not eligible for federal highway funding.

With tremendous demands for highway maintenance and construction, ODOT is seeking innovative ways to reduce costs, including assessing rest area opportunities. Other state departments of transportation and toll authorities operate rest areas as concessions, saving the cost of rest area operations and maintenance and generating an ongoing stream of revenue to fund highway projects.

³⁵ ODOT press release: State Advances Plan to Develop Non-Interstate Rest Areas

Federal Law and Interstate Rest Areas

Federal law prohibits commercial establishments on interstate highways built after 1956. The U.S. Code (Section 111 of U.S. Code Title 23 – Highways) requires the U.S. Secretary of Transportation and each State to establish an agreement that “the State will not permit automotive service stations or other commercial establishments for serving motor vehicle users to be constructed or located on the rights-of-way of the Interstate System.”

The recent federal surface transportation funding act, MAP-21, did not include language authorizing states to commercialize existing rest areas on interstate highways. MAP-21 does permit limited commercial activities by private operators, such as sales of items or tickets related to state tourism and travel related information, in rest areas established by states. States must use any revenues obtained from these commercial activities for acquiring, constructing, operating and maintaining rest areas in the state.³⁶

Considerations for Commercial Development of Rest Areas

The following elements are key considerations related to commercial development of Ohio’s rest areas:

- Sources of revenue: Toll road rest areas have extensive food and fuel sales which increase the financial prospects of concessions. ODOT will need to consider what is allowable in terms of service offerings to make the P3 attractive to investors.
- Development agreement terms: The terms of a request for proposals or /commercial development agreement should allow the private partner adequate flexibility to achieve the maximum value for the transaction while meeting the State’s objectives.
- Market sounding: Vetting concession terms with industry can help to gauge interest and valuation of a transaction.
- Stakeholder perspectives: Outreach to stakeholders can increase stakeholder engagement and allow concerns to be addressed early in the process.
- Transaction cost: Depending on the value of the development, transaction costs could make potential opportunities unattractive.

³⁶ <http://www.govtrack.us/congress/bills/112/hr4348/text>

Financial Analysis

Introduction

Financial analyses were performed related to the Status Quo with Increased Bonding Capacity, Public, and Public-Private Options under consideration using cost and revenue inputs developed by Parsons Brinckerhoff with concurrence from ODOT, and financing assumptions developed by KPMG, informed through market soundings, and with concurrence from OBM and ODOT. For the Status Quo with Increased Bonding Capacity, the Analysis assumes the OTC will leverage future revenues through issuance of additional tax exempt bonds. For the Public Option, the Analysis assumes the financing assumptions of the Status Quo Option, in addition to delivery of operations and maintenance in collaboration with ODOT. For the Public-Private Option, the Analysis assumes private operation of the Turnpike, and reflects the economic value that a Concessionaire would deliver as a “concession fee” to the State, as well as methods for on-going revenue share arrangements throughout the term of a potential concession.

Based on the objectives of the analysis, as articulated in the introduction of this report, there emerged seven primary public policy drivers for this project. The table below outlines these policy drivers and how they are reflected in the Status Quo with Increased Bonding Capacity, Public, and Public-Private Options:

Ohio Objectives for the Analysis	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Maintain Turnpike Ownership and Public Control	The State maintains ownership of the Turnpike, and it is operated by OTC based on current performance metrics	The State maintains ownership of the Turnpike, and it is operated by OTC in collaboration with ODOT based on established performance metrics	The State maintains ownership of the Turnpike and control of the Turnpike via an enforceable contract which stipulates maintenance conditions and service levels that are equal or better than current Turnpike and/or ODOT practices.
Benefit Northern Ohio Communities	ETC users traveling Local Trips will not incur a toll rate increase for the first 10 years. Bond proceeds may be used by the State to complete critical transportation projects, including those in northern Ohio. Additionally, excess cash flow from the Turnpike operations may be potentially available for use on other highway related projects.	ETC users traveling Local Trips will not incur a toll rate increase for the first 10 years. Bond proceeds may be used by the State to complete critical transportation projects, including those in northern Ohio. Additionally, excess cash flow from the Turnpike operations will be distributed back to ODOT for use on other highway related projects.	ETC users traveling Local Trips will not incur a toll rate increase for the first 10 years. Concession fee and revenue share may be used by the State to complete critical transportation projects, including those in northern Ohio.

Ohio Objectives for the Analysis	Status Quo with Increased Bonding Capacity	Public Option	Public-Private Option
Fair and Predictable Toll Rates	Tolls increases approximate the rate of inflation for the first 10 years. Future toll policy will be based on capital needs, coverage ratio requirements, and policy decisions.	Tolls increases approximate the rate of inflation for the first 10 years. Future toll policy will be based on capital needs, coverage ratio requirements, and policy decisions.	Cash toll rate increases will be capped annually at the change in CPI. ETC toll rate increases will also be capped annually at the change in CPI, after initially increasing to match cash toll rates in year 5.
Upfront Payment	Year 1 new money bond issue will provide revenue for the State's transportation program. A second bond issue will occur within the subsequent five years.	Year 1 new money bond issue will provide revenue for the State's transportation program. A second bond issue will occur within the subsequent five years.	Upfront concession fee delivered from the private Concessionaire upon contract and financial close.
Revenue Share	All excess cash flows from Turnpike operations will continue to be under the control of the OTC and utilized at its discretion.	Excess cash flow over time may provide future value from the Turnpike, particularly if OTC and ODOT are able to achieve future cost efficiencies.	State to receive a 15% gross revenue share, providing a long-term benefit and a dedicated funding stream to enhance ODOT's capital program.
Promote Job Creation and Economic Growth	The Status Quo with Increased Bonding Capacity will provide funding for Ohio's transportation program, which will help accelerate delivery of capital projects.	The Public Option will provide funding for Ohio's transportation program, which will help accelerate delivery of capital projects.	The Public-Private Option will provide funding for Ohio's transportation program, which will help accelerate delivery of capital projects.
Manage Diversion	Truck diversion is projected to remain stable at diversion rates similar to current levels for the first ten years. Thereafter, truck diversion is projected to decrease due to toll rate increases at less than forecast inflation rates.	Truck diversion is projected to remain stable at diversion rates similar to current levels for the first ten years. Thereafter, truck diversion is projected to decrease due to toll rate increases at less than forecast inflation rates.	Tolls will increase at no more than the rate of inflation after the first five years. Some incremental diversion may occur in the first several years but diversion is expected to stabilize thereafter. In general, the CPI-based annual toll increases are more predictable than higher, sporadic increases which have driven diversion in the past.

Approach and Methodology

For the Status Quo with Increased Bonding Capacity and Public Options, the following approach was used:

- The commercial structure of the scenarios was determined (e.g. number of bond issues) and the appropriate financial assumptions were agreed upon with ODOT and OBM;
- The financial model was developed based on the commercial structure of the transaction;
- Inputs (i.e., revenues, operations and maintenance costs, and capital maintenance costs) generated by Parsons Brinckerhoff were used in the analysis consistent with the information and data presented in the Technical Assessment chapter of this report;
- The municipal bond modeling computer software, DBC® Finance, was used to model the forecasted issuance of revenue bonds used in the financial model. DBC® Finance sizes and structures municipal bond issues based on a set of financial constraints that are set by the user of the program, such as, coverage ratios, bond term, and annual cash flow available for debt service. The DBC® Finance output was used to inform assumptions around the bond issues, specifically par amount and annual debt service;
- In order to appropriately measure the value of the excess cash flows, a detailed study of the discount rate was conducted. Discount rates are discussed in detail later in the report (“Valuation of Future Cash Flows” section); and
- The scenarios were analyzed with the financial model based on stated objectives of the State. Several rounds of commercial and financial analysis and sensitivities were performed. In these two Options, 24 scenarios were evaluated based on different revenue scenarios, cost forecasts, and financing assumptions.

For the Public-Private Option, the following approach was used:

- An analysis of the defeasance costs and the IRS penalty was completed prior to creating the assumptions for the Public-Private Option so that these costs could be included in the Public-Private Option scenarios;
- The commercial structure for the Public-Private Option scenarios was determined and agreed upon by ODOT and OBM (i.e., tolling policy, revenue share vs. upfront payment) and financing assumptions were developed based on the commercial structure determined;
- The financial model was developed based on the commercial structure and financing assumptions for the Public-Private Option;
- The Public-Private Option inputs (i.e., revenues, operating and maintenance costs, capital maintenance costs) were generated by Parsons Brinckerhoff consistent with the assumptions discussed in the Technical Assessment chapter of this report; and
- Using the financial model, the Public-Private Option scenarios were analyzed based on the objectives of the State. 20 Public-Private Option scenarios were evaluated based on different revenue, cost, and technical assumptions.

Commercial Assumptions

The following commercial assumptions were developed based on the public policy drivers for the Status Quo with Increased Bonding Capacity, the Public Option and the Public-Private Option.

Status Quo with Increased Bonding Capacity and Public Option Commercial Assumptions

Bond Proceeds and Excess Cash Flow

The Analysis explored different bond issuance structures that enable the State to realize the benefit of receiving revenue over time versus only in upfront proceeds. In these scenarios the Analysis contemplates a two new money issue structure, with one issue in the first year, and the second issue five years later. The final assumption regarding bonding was reached after a variety of structures were analyzed including bonding in the first year of \$1.0 billion. Utilizing a two-issue structure allows the State to receive cash from the initial issue while leveraging the forecasted revenue increases. In the Public Option, taking advantage of the potential for operations and maintenance program enhancements achieved prior to a second bond issuance.

The State may receive incremental cash flows over time under the Status Quo with Increased Bonding Capacity or the Public Option, based on operational performance of the Turnpike. In contrast, the Public-Private option's revenue share distributes 15% of gross cash flow to ODOT, paid prior to payment of the Concessionaire's expenses, finance and capital costs. By contrast to the gross revenue participation of the Public-Private Option, any excess cash flow in the Status Quo with Increased Bonding Capacity and Public Options is neither guaranteed nor pledged to the State.

Tolling Policy and ETC

For public entities, the ability to control future tolling policy is limited and future toll increases may be uncertain, particularly if debt service coverage ratios are met or there are declining levels of debt outstanding. In the two options, 10-year horizon for annual increases at CPI was deemed reasonable, because, during that time period, OTC would need to maintain coverage ratios on newly issued debt. The CPI-based increases are estimated at 2.70% in the Analysis based on the 30-year Midwest historical average. Following the initial 10-years, tolls are forecast to increase 10% every 10 years to align with the estimate of future toll increases described in the OTC's long-term projections. The State expressed the desire to examine the effect of granting discounts for automobiles traveling short distances that used ETC. In order to measure the cost of this discount, the Analysis considers a 10 year freeze on E-ZPass toll rates for Local Trips, with a direct comparison to the "non-freeze" scenario.

Service Plazas

Currently, OTC contracts with numerous private entities through separate agreements to operate the 16 service plazas (i.e., 8 pairs). OTC would retain its current approach to managing the service plazas.

Bond Term

The term of the analysis is assumed to be 50 years. The bond term is assumed to be between 30-35 years in order to take advantage of tax-exempt bond investor market appetite.

Diversion

Truck diversion from the Turnpike onto parallel routes is a concern for residents of northern Ohio and the State. Therefore, the Analysis assumes toll rate increases that are not expected to increase traffic diversion. This topic is discussed in greater detail in the Technical Assessment chapter of this report.

Public-Private Option Commercial Assumptions

Upfront Payment and Gross Revenue Share

A primary objective of the State is to generate funding for transportation projects. To achieve this objective under the Public-Private Option the State will need to defease all of the current outstanding Turnpike debt, in keeping with IRS restrictions related to projects funded with tax-exempt bonds. In addition, the State determined that participation in a gross revenue share agreement was beneficial in providing an ongoing stream of payments that would help fund ODOT's programs over the life of the contract.

The Analysis explored a variety of combinations of the upfront concession payment and the gross revenue share. Scenarios ranged from 100% upfront payment to a fixed upfront payment with either a fixed or variable gross revenue share. Fixed upfront payments were set at either \$2.8 billion or \$2.0 billion (to provide approximately \$2bn or \$1.2bn proceeds to the State after defeasance costs), and fixed revenue share scenarios were analyzed at both 10% and 15%.

Defeasance

In the Public-Private Option, a portion of the funds obtained in an upfront payment would be used to defease outstanding Turnpike tax-exempt debt. In addition to paying the cost of defeasance, the State would be faced with paying a penalty imposed by the IRS tied to certain OTC bonds, if the State chooses to receive payments over time, as is the case in a revenue share arrangement.

The cost of a defeasance of the OTC's existing debt has been estimated to be approximately \$735 million (SLGS rates as of October 10, 2012) and the cost of the IRS penalty is estimated at approximately \$65 million (Applicable Federal Rates, "AFRs" as of October 2012). In total therefore, an upfront payment received by the State would need to net out costs of approximately \$800 million related to the existing tax-exempt bonds, with the remainder of proceeds available for ODOT capital projects.

Defeasance is discussed in more detail under "Bond Defeasance Considerations" below.

Tolling Policy and ETC

The State desired to create tolling policy assumptions for the Public-Private Option that would be acceptable to both Turnpike users and to the private investor markets, and determined that CPI toll increases would best address both issues. Therefore, in the Analysis, the 30-year Midwest historical CPI average of 2.70% was used to approximate expected annual toll increases.

The State also expressed the desire to examine the effect of granting discounts for automobiles traveling short distances that used ETC. In order to measure the cost of this discount, the Analysis considered a 10 year freeze on E-ZPass toll rates for Local Trips and compared this to scenarios that did not reflect that freeze.

The State also chose to explore a general increase of ETC tolls to cash toll levels over a 5-year period.

Service Plazas

Under the Public-Private Option, the Turnpike's 16 service plazas are assumed to be included within the concession, with the Private Partner responsible for all operation and maintenance obligations. While market sounding participants stated that service plazas are not expected to be a significant value driver they offer an important customer service contact point with Turnpike users, and there was therefore a stated preference for private control of the facilities.

Length of Contract Term

The length of the contract assumed between the State and a Concessionaire has a significant effect on the value that can be delivered under the Public-Private Option. Specifically, the term must be long enough to attract market interest, including financial investment capital, as well as provide certain tax benefits, but short enough to avoid marginalization of benefit in present value terms. A range of 45-60 years was considered, and 50 years was agreed upon for the purposes of the Analysis.

Diversion

As stated previously, truck diversion is an important consideration, and therefore the Analysis considered methods of managing diversion in the context of establishing unit toll limits.

Assumptions for Financial Analyses

Status Quo with Increased Bonding Capacity and Public Option

These two options are intended to demonstrate the value of leveraging the Turnpike under its current management and an updated Master Trust Indenture. In addition, under the Public Option, operating efficiencies are assumed to positively impact the bonding capacity of the OTC. Both options assume a 50-year analysis period.

As stated previously, the toll rate growth assumption is annual CPI for the first 10 years, followed by 10% unit toll increases every 10 years thereafter. While the Status Quo with Increased Bonding Capacity assumes that operations and maintenance, and capital improvements, remain the same as current OTC operations, the Public Option identifies the potential for driving additional value based on achieving further efficiencies. In these options, service plazas operations are assumed to continue under existing private operations and maintenance policies.

Inputs	
Analysis Term	50 years
Inflation Rate (Revenue, O&M, and Capital Maintenance)	2.7% (CPI Midwest region, 30 year historical average)
Toll Rate Escalation	CPI increase for 10 years followed by 10% increases every 10 years
Toll Structure	Flat fee based on vehicle classification and payment method
ETC Penetration	Assumes Turnpike patrons will adopt E-ZPass at the rate currently forecast by the OTC
Local Trip Discount	For the first 10 years, the ETC toll rate for Local Trips will not change
	After 10 years, toll rates for Local Trips increase in accordance with the toll rate escalation policy above

Inputs	
Service Plazas	Service plazas may be maintained through existing practice and/or service contracts.
Capital Maintenance	Funded via dedicated reserves
Handback provisions	N/A
Excess Cash Flow Discount Factor	6.5% – 8.75%

Financial Structure

The Status Quo with Increased Bonding Capacity Option and the Public Option both assume the OTC will issue additional tax-exempt bonds based on forecast net toll revenues, and neither scenario contemplates a need to defease existing tax-exempt debt. Rather, existing senior lien bonds would retain their first claim on net toll revenues, although the existing lien would be “closed” to new issuance. Such a structure should protect existing tax-exempt bondholders from any perceived credit deterioration, even though the new Master Trust Indenture would provide for future issuance tied to less conservative forward-looking tests.

It is contemplated that new tax-exempt bonds would be issued under both “2nd senior” and subordinate liens, with both limited to issuance amounts that satisfy “forward looking” additional bonds tests. Such an approach is consistent with other borrowing programs in the market, and would significantly increase the borrowing capacity of the OTC. It is contemplated that, based upon closing the existing senior lien, the new 2nd senior lien bonds may also target a ‘AA’ category rating. For purposes of analysis, debt service coverage based on forecast net revenues was targeted at 2.25x senior debt. In addition to the 2nd senior lien bonds, a new subordinate lien would be established to provide additional bonding capacity. It is contemplated that this lien would be structured to provide for an ‘A’ category rating, and for analysis purposes “global” debt service coverage based on forecast net revenues was targeted at 1.60x. All debt would be issued in the tax-exempt bond markets; therefore for analysis purposes interest rates were set at a spread from the Municipal Market Data (“MMD”) benchmark. Finally, the analysis assumes two bond issuances, with the first in year 1 and the subsequent issue in year 5.

Financial Structure	
Debt Program	<ol style="list-style-type: none"> 1) Existing senior lien – closed 2) New 2nd senior lien issued under new Master Trust Indenture (based on updated Additional Bonds Test and Toll Covenant) 3) New subordinate lien issued under new Master Trust Indenture (based on updated Additional Bonds Test and Toll Covenant)
Debt Security	Revenue bonds backed by system net toll revenues
Targeted Debt Service Coverage	<p>Senior debt service coverage target: 2.25x (Forecast prior to Major Maintenance funding)</p> <p>Global debt service coverage target: 1.60x (Forecast prior to Major Maintenance funding).</p>

Financial Structure	
	Major Maintenance Reserve established to fund requirements after payment of debt service
New Master Trust Indenture Additional Bonds Tests and Toll Covenant	To be determined, as reflected in future rating agency and municipal market discussions ³⁷
Target Debt Rating	Senior Lien: AA/Aa2 Subordinate Lien: A/A2
Gross Revenue Share	N/A
Benchmark Rates	MMD
Margin	AA and A spread from MMD
30 Year yield	3.05%/3.52% (AA/A) as of 10/26/12
Refinancing / Releveraging Interest Rate	N/A
Tax Basis	Tax-exempt

Public-Private Option

The Public-Private Option is intended to represent the Turnpike under the management of a private toll road Concessionaire. For the Public-Private Option, the contract term is modeled at 50 years, with inflation rate assumptions at 2.7%, the 30 year Midwest historical average. The base case assumption for toll revenue growth for the Public-Private Option is annual toll rate increases of CPI. The Public-Private Option includes the service plazas within the assets operated and maintained under the concession contract. The Public-Private Option also assumes specific capital maintenance requirements that the Concessionaire would be required to complete under performance-based provisions to be specified in the concession contract. Additionally, the estimated costs of specific handback provisions are reflected in all Public-Private scenarios.

Inputs	
Contract Term	50 years
Gross Revenue Share Discount Factor	3.5% – 5.0%
Excess Cash Flow Discount Factor	N/A
Inflation Rate (Revenue, O&M, and Capital	2.7% (CPI Midwest region, 30 year historical

³⁷ Pursuant to the Opportunities Analysis no direct contact has been made with the rating agencies, in an effort to avoid any uncertainty with any potential OTC rating activities and dialogue. Specific covenants related to a new Master Trust Indenture will be informed by market precedent and expected rating agency discussions.

Inputs	
Maintenance)	average)
Toll Rate Escalation	CPI
Toll Structure	Flat fee based on vehicle classification and payment method
ETC Penetration and E-ZPass/Cash Toll Rate Convergence	Assumes that Turnpike patrons will convert to E-ZPass at a faster rate than currently forecast by the OTC E-ZPass toll rates are increased to current cash rates in the first 5 years
Local Trip Discount	Freeze E-ZPass tolls for Local Trips for an initial 10 year period In years 11 – 15, ETC toll rates for Local Trips would increase to cash toll rates.
Service Plazas	Included
Capital Maintenance	Required based on performance specifications
Handback Provisions	Facility to be managed through performance based contract specifications for bridge conditions, pavement conditions, and maintenance conditions

Financial Structure

The Public-Private Option assumes private equity and senior lien taxable bonds will be used to finance the upfront concession payment under a private concession scenario. The debt is structured to achieve minimum investment grade (BBB-/Baa3) ratings, and the private equity is assumed to require an 11% after tax return, which is based on the feedback obtained during the market soundings. The assumed minimum net debt service coverage to achieve investment grade ratings is 1.30x for the initial financing. Future re-leveragings are assumed to require a minimum 1.25x DSCR.

Financial Structure	
Debt Program	Senior lien “non-recourse” taxable revenue bonds
Debt Security	Toll revenue bonds secured by net system toll revenues
Targeted Debt Service Coverage	Minimum senior lien debt service coverage: 1.30x (Forecast after Major Maintenance funding) Re-leveraging requirement: 1.25x
Target Debt Rating	BBB-/Baa3

Financial Structure	
Target Equity Return	11.0% (after tax)
Gross Revenue Share	15% beginning in year 6 through the term of the contract
Benchmark	30-year Treasury
Margin	2.75%
Taxable Rate	5.37% as of 10/29/12
Refinancing / Releveraging Interest Rate	6.87% (Taxable Rate + 150 bps)
Tax Basis	Federally taxable; State tax exempt

Development of Scenarios

Status Quo with Increased Bonding Capacity and Public Option

The initial scenarios developed for the Analysis assumed toll rates would increase based on the change in CPI per year. Alternative revenue scenarios were later developed to assess a range of toll rate policies. The Status Quo with Increased Bonding Capacity and Public Option revenue scenarios include:

- Revenue CPI Cap (1.35%, 2.00%, and 2.70%)
- Revenue CPI Cap, then 10-10
- Revenue CPI Cap + Local ETC Freeze
- Revenue CPI Cap + ETC Equalization
- Revenue CPI Cap, then 10-10 + Local ETC Freeze

Revenue CPI Cap (1.35%, 2.00%, 2.70%). The first scenarios developed were based on assumed annual toll increases of 1.35%, 2.00%, or 2.70%. These assumptions represented increases by the change in CPI (2.70%), two-thirds of CPI (2.00%), and half of CPI (1.35%).

Revenue CPI Cap, then 10-10. This scenario assumes toll rates increase by the change in CPI (2.70%) for 10 years, then permits 10% increases every 10 years thereafter.

Revenue CPI Cap and Local ETC Freeze. This scenario calls for annual toll increases by the change in CPI (2.70%) for users paying cash tolls and non-local drivers paying ETC tolls.. For the first ten years, ETC toll rates are frozen for Local Trips. After the first ten years, the freeze ends and the local ETC tolls match the cash toll rates. Once ETC reaches the cash toll rate, both ETC and cash toll rates increase annually by the change in CPI.

Revenue CPI Cap and ETC Equalization in five years. This scenario includes annual toll increases at the change in CPI (2.70%) for cash tolls. ETC tolls increased to equal the cash toll levels over five years. After five years, both ETC and cash toll rates increase annually by the change in CPI.

Revenue CPI Cap, then 10-10 and Local ETC Freeze. This scenario combines the CPI increase for the first 10 years, followed by 10% increases every 10 years, while also including the local ETC freeze for

Local Trips. After the first ten years, the freeze ends and the local ETC tolls increase to match the cash toll rates. Once ETC reaches the cash toll rate, both ETC and cash toll rates increase annually by the change in CPI.

Regarding transaction structure, four transaction structures were analyzed over the period of the Analysis. These structures included:

- Maximize Upfront Proceeds
- Fixed Upfront Payment of \$1.25 billion, remaining value to be received through excess cash flow
- Fixed Upfront Payment of \$2.00 billion, remaining value to be received through excess cash flow
- Two Bond Issues, 5-years apart, upfront payment of approximately \$1.00 billion, remaining value to be received through excess cash flow.

Maximize Upfront Proceeds. This structure maximizes the upfront proceeds the State receives in the first year at financial close.

Fixed Upfront Payment of \$1.25 billion, remaining value to be received through excess cash flow. This structure fixes the upfront proceeds at \$1.25 billion.

Fixed Upfront Payment of \$2.00 billion, remaining value to be received through excess cash flow. This structure similarly fixes the upfront proceeds at \$2.0 billion.

Two Bond Issues, 5-years apart. This structure has two bond issues, which are five years apart. The first issuance occurs in year one and the second issuance occurs in year five. The first issuance is sized to generate net proceeds of approximately \$1.0 billion. The second issuance is sized to the maximum amount that can be raised while maintaining the 2.25x and 1.60x debt service coverage ratios on the senior and subordinate liens. Remaining value would be received through excess cash flow.

Operations and Maintenance Efficiencies The Public Option assumes the closer alignment with ODOT in the provision of certain operation and maintenance services, resulting in cost efficiencies in the 5 year period between the first and second bond issues.

These transaction structures were assumed to match the transportation needs of the State. Upfront proceeds enable the State to address immediate transportation funding needs while receiving operating distributions from the Turnpike over time. The two bond issuance structure provides upfront proceeds while providing additional proceeds to the State in five years.

Scenarios Analyzed

“Revenue CPI Cap, then 10-10 and Local ETC Freeze” was determined to be the final revenue scenario for the Status Quo with Increased Bonding Capacity and Public Option. The revenue scenarios that assume CPI-based toll increases for the full 50 year term of the Analysis may not be realistic for these options. Historically, public toll agencies have not adjusted tolls over time to keep pace with inflation, but rather have charged the minimum needed to meet operational and debt service requirements.

The “Revenue CPI Cap, then 10-10 and Local ETC freeze” assumes a moderate toll increase that increases by the change in CPI for only 10 years. Additionally, a freeze on electronic tolls for automobiles making Local Trips is implemented.

Regarding the transaction structures, the two bond issuance structure (bond issues occurring in years 1 and 5) was preferred over structures which focused on a maximum upfront payment. The two bond

issuance structure provides funding for the State's near-term and longer-term transportation funding needs.

Public-Private Option

The initial Public-Private Option scenarios developed for the Analysis assumed that toll rates would increase by the percentage change in CPI per year. As the Analysis developed, alternative revenue scenarios were developed to assess a range of toll rate policies. The scenarios developed include:

- Revenue CPI Cap (1.35%, 2.00%, and 2.70%)
- Revenue CPI Cap + Local ETC Freeze
- Revenue CPI Cap + ETC Equalization in five years
- Revenue CPI Cap + Local ETC Freeze + ETC Equalization in five years

Revenue CPI (1.35%, 2.00%, 2.70%). These scenarios assume annual toll increases of 1.35%, 2.00%, or 2.70%. These assumptions represent toll rate increases by the change in CPI (2.70%), two-thirds of CPI (2.00%), and half of CPI (1.35%).

Revenue CPI Cap + Local ETC Freeze. This scenario calls for annual toll increases by the change in CPI (2.70%) for drivers paying cash tolls and using ETC. For the first ten years, ETC toll rates are frozen for automobiles taking Local Trips. After the first ten years, the freeze ends and toll rates for local ETC trips are increased over 5 years to match the cash toll rates. Once ETC reaches the cash toll rate, both ETC and cash toll rates increase annually by the change in CPI.

Revenue CPI Cap + ETC Equalization in five years. The scenario includes annual toll increases at 2.70% (change in CPI) for five years for users paying cash. ETC tolls increase to equal the cash toll levels over five years. After five years, both ETC and cash toll rates increase annually by the change in CPI.

Revenue CPI Cap + Local ETC Freeze + ETC Equalization in five years. This scenario is a hybrid of the prior two scenarios. Cash tolls increase at 2.70% (change in CPI). ETC toll rates increase to cash toll rates within the first five years. ETC rates for Local Trips remain frozen for ten years before increasing to cash and other ETC rates.

Several transaction structures were analyzed to measure the effect of different payment requirements from a private party, including:

- Maximize Upfront Payment
- Fixed Upfront Payment of \$2.80 billion, Market Bid Revenue Share
- Fixed Upfront Payment of \$2.00 billion, Market Bid Revenue Share
- Fixed Revenue Share of 10%, Market Bid Upfront Payment
- Fixed Revenue Share of 15%, Market Bid Upfront Payment

Maximize Upfront Payment. The structures that maximize the upfront payment the State receives does not include a revenue share component, rather a single upfront payment in year one.

Fixed Upfront Payment of \$2.80 billion, Market Bid Revenue Share. The first variation of a fixed upfront payment structure provides the State an upfront payment of \$2.80 billion and includes a gross revenue

share component. The \$2.80 billion upfront payment defeases all outstanding Turnpike bonds. After defeasance, approximately \$2.00 billion remains for State transportation needs.

Fixed Upfront Payment of \$2.00 billion, Market Bid Revenue Share. This fixed upfront payment structure provides an upfront payment of \$2.00 billion, large enough to defease all outstanding bonds with approximately \$1.25 billion remaining for State transportation needs. In addition, the upfront payment structure supports a gross revenue share component over the life of the contract.

Fixed Revenue Share of 10%, Market Bid Upfront Payment. This structure fixes the gross revenue share to 10% during the life of the contract, and yields the highest upfront payment possible under such a constraint.

Fixed Revenue Share of 15%, Market Bid Upfront Payment. This scenario increases the fixed gross revenue share to 15% and maximizes the upfront payment under that constraint.

Scenarios Analyzed

The Analysis focused on revenue scenarios that included annual toll rate increases of 2.7% (change in CPI). Feedback from the market sounding demonstrated a consensus among market participants that change in CPI was an acceptable cap for tolling increases for the Public-Private Option.

Variations on the toll increases of 2.7% were performed and included all tolls increased at 2.7%, a ten-year local ETC freeze, ETC equalization in five years, and the hybrid structure including both a ten-year local ETC freeze and ETC equalization in five years.

Various payment structures were evaluated including maximizing the upfront payment, a fixed \$2.8 billion upfront payment, and a fixed \$2.0 billion upfront payment. Maximizing the upfront payment achieved a one-time payment of over \$3.00 billion, but this option did not provide the State with a long-term revenue stream and ongoing potential to benefit from the transaction. The structure with a variable revenue share and a fixed \$2.80 billion upfront payment produced only a minimal (less than 5%) revenue share. Finally, the fixed \$2.00 billion upfront payment structure increased the revenue share, but after defeasance costs, the remaining upfront payment did not reach a level sufficient to meet the State's objectives.

Since the upfront payment did not produce a payment structure or revenue stream that could meet the State's objectives, a fixed long-term gross revenue share of 10% or 15% was evaluated, along with an upfront payment. The "Fixed Revenue Share of 15%, Market Bid Upfront Payment" maximized the upfront payment within the constraints of the fixed long-term revenue share and thus was the preferred scenario chosen as the Public-Private Option by the State.

Summary of Analysis Results

The following provides the summary of analysis results. Each option identified by the State includes:

- Qualitative considerations on the relative strengths, weaknesses, threats, and opportunities and a preliminary implementation calendar with action items.
- Quantitative, indicative financial analysis based on financing assumptions agreed to with the State and cost and revenue inputs provided by PB as the technical advisor.

Status Quo with Increased Bonding Capacity

Assumptions

The analysis of these options is based on the following assumptions and cost estimates:

- The OTC will remain an independent agency;
- The operations, maintenance and capital maintenance of the Turnpike will mirror present day operations and capital planning;
- Existing OTC debt obligations will remain outstanding and the OTC will remain the issuer of future Turnpike debt obligations;
- New debt secured by Turnpike revenues will be issued under amended guidelines through a new Master Trust Indenture, which will establish new debt covenants for a new “2nd senior” lien and a subordinate lien;
- New toll policies will be established, identifying parameters for target debt service coverage and other key financial and commercial priorities;
- Cash and ETC toll rates will increase annually based on the change in the CPI for the first 10 years; toll policy after the first 10 years will reflect future capital needs of the Turnpike; and
- ETC rates for Local Trips will remain constant for 10 years.

Estimates and Model Inputs

- Under the Status Quo with Increased Bonding Capacity, the Analysis assumes the Turnpike's operating structure will remain largely unchanged. Estimated capital improvements would require reinvestment of approximately \$3.3 billion (2012 dollars), excluding service plazas, over the 50 year evaluation period.

Qualitative Considerations

The Analysis of the Status Quo with Increased Bonding Capacity identified the following benefits and considerations:

Status Quo with Increased Bonding Capacity	
Benefits	Considerations
<ul style="list-style-type: none"> ■ The OTC retains direct responsibility and control over the Turnpike, including toll rate setting, service level, and capital investment. ■ Current tax-exempt interest rates available in the municipal market are favorable relative to historical benchmarks. 	<ul style="list-style-type: none"> ■ The OTC retains comprehensive risks of maintaining, operating, and leveraging Turnpike. ■ The OTC is estimated to invest approximately \$3.3 billion (2012 dollars) in capital maintenance costs over the 50 year evaluation period. ■ The OTC would be required to consistently increase tolls to realize expected value. ■ Bond issues beyond the initial financing would be subject to various risks, including market risk, project performance risk, etc. ■ Increased debt burden results in reduced operating flexibility. ■ The potential exists for forced toll adjustments to maintain coverage ratios and meet capital investment needs.

Financial Results

The Status Quo with Increased Bonding Capacity Option assumes two new money bond issues, the first of which would occur in the first year of the analysis period (year 1) and the second of which would occur in the fifth year (year 5). This scenario assumes that the first and second tranches are issued under a new OTC Master Trust Indenture which permits the OTC to leverage forecasted increases in future revenue.

The Status Quo with Increased Bonding Capacity Option results in net bond proceeds of approximately \$1.003 billion for the initial bond issue in year 1 and \$451 million for the second bond issue in year 5 (a present value of \$353 in year 5, discounted at 5.00%). Together, the two issues would provide net proceeds of approximately \$1.454 billion (or a present value of \$1.357 billion discounted at 5.00%).

The estimated excess cash flows, albeit modest, in the Status Quo with Increased Bonding Capacity option are assumed to be retained by the OTC and utilized at its discretion.

A summary of the Status Quo with Increased Bonding Capacity analysis output is below:

Scenario	Status Quo Option
Upfront Proceeds (nominal)	
Upfront Payment (Year 1)	\$1,003m
Payment from Second Issuance (Year 5)	\$451m
(PV of Second Issuance @ 5%)	\$353m
Defeasance Cost	-
IRS Penalty *	-
Net Proceeds (5 years) (nominal in years 1 and 5)	\$1,454m
Capital Structure	
New Debt Issuance	\$1,688m
Equity	N/A
Post Tax Equity IRR	N/A
Debt: Equity Ratio	N/A
Average Life of Debt	27 Yrs

Implementation Timeline

The Status Quo with Increased Bonding Capacity could be implemented in under one year, assuming a decision to proceed with the Status Quo with Increased Bonding Capacity, as described in the Analysis, is made in December 2012. Below is a timeline that outlines some of the critical actions that would be required to implement the Status Quo Option. If the State selects a variation of the Status Quo with Increased Bonding Capacity, the steps and dates in the timeline for implementing that approach would likely be different than the ones listed below.

Timeline	Action
December 2012	Decision to pursue the Status Quo with Increased Bonding Capacity
December 2012 – January 2013	Conduct legal analysis for legislative purposes
December 2012 – February 2013	Draft legislation
February 2013	ODOT budget bill introduced with new legislation included
April 2013	ODOT budget bill passed
March – August 2013	<ul style="list-style-type: none"> ■ Develop plan of finance ■ Develop new Master Trust Indenture ■ Initiate investment grade traffic and revenue study
September 2013/Ongoing	Rating agency updates
October 2013	Initial bond issue

Public Option

Assumptions

- The OTC will remain a going concern, but will be more closely aligned with ODOT in order to achieve certain operations and maintenance cost efficiencies;
- The OTC and ODOT will re-assess operation and maintenance responsibilities on the Turnpike and potentially consider streamlining operations through Qualified Management Contracts;
- Existing OTC debt obligations will remain outstanding; however, the existing senior lien will be closed to new debt issues;
- New debt secured by Turnpike revenues will be issued under a new Master Trust Indenture that will establish new debt covenants for a new “2nd senior” and subordinate lien;
- New toll policies will be established, identifying parameters for target debt service coverage and other key financial and commercial priorities;
- Cash and ETC toll rates will increase annually based on the change in CPI for the first 10 years; toll policy after the first 10 years will reflect future capital needs of the Turnpike;
- ETC rates for Local Trips will remain constant for 10 years; and
- Facility operations and maintenance will be the OTC and ODOT's responsibility and the Turnpike will be maintained to ODOT interstate standards.

Estimates and Model Inputs

- Under the Public Option, the Analysis assumes that the Turnpike's operating structure will be closely coordinated with ODOT. Estimated capital improvements would require reinvestment of approximately \$3.3 billion (2012 dollars), excluding service plazas, over the 50 year evaluation period.
- The outcome for the Public Option is based on incorporating operations and maintenance efficiencies into the current operating structure of the OTC. This scenario assumes that the OTC would be more closely aligned with ODOT, having certain operations and maintenance guidelines mirror those of ODOT's standards for its Interstate highway operations. Potential operations and maintenance efficiencies assumed include reduction of Turnpike administrative costs through elimination of redundant functions currently provided by both OTC and ODOT; streamlining of toll collection operations; closure of two maintenance facilities and expansion of the remaining six maintenance facilities; mirroring ODOT maintenance staffing practices in terms of work rules and use of seasonal staff in peak winter months; and streamlining operations of service plazas. The scenario assumes that the OTC will achieve annual cost savings of approximately 21%, compared to current Turnpike operations, within a 10 year period, as estimated by the Technical Analysis team.

Qualitative Considerations

The Analysis identified the following benefits and considerations of the Public Option.

Public Option	
Benefits	Considerations
<ul style="list-style-type: none"> ■ The OTC and ODOT maintain responsibility and control over the Turnpike, including toll rate setting, service level, and capital investment. ■ Current tax-exempt interest rates available in the municipal market are favorable relative to historical benchmarks. ■ Operating and maintenance efficiencies may be realized through alignment with ODOT by eliminating redundancies, creating economies of scale, and other efficient practices. 	<ul style="list-style-type: none"> ■ The OTC retains comprehensive risks of maintaining, operating, and leveraging Turnpike. ■ The OTC is estimated to invest approximately \$3.3 billion (2012 dollars) in capital maintenance costs over the 50 year evaluation period. ■ The OTC would be required to consistently increase tolls to realize expected value. ■ Bond issues beyond the initial financing would be subject to various risks, including market risk, project performance risk, etc. ■ Increased debt burden results in reduced operating flexibility. ■ The potential exists for forced toll adjustments to maintain coverage ratios and meet capital investment needs. ■ Future excess cash flows may be impacted by a wide array of project and market risks.

Financial Results

The Public Option assumes two new money bond issues, the first of which would occur in the first year of the analysis period (year 1) and the second of which would occur in the fifth year (year 5). For the Public Option, the first and second bonds are issued under a revised OTC Master Trust Indenture which permits the OTC to leverage future forecasted growth in toll revenue.

The Public Option results in net bond proceeds of approximately \$1.003 billion for the initial bond issue in year 1 and \$1.064 million for the second bond issue in year 5 (a present value of \$833 in year 5, discounted at 5%). Together, the two issues would provide net proceeds of approximately \$2.067 billion (or a present value of \$1.836 billion discounted at 5.00%).

The estimated excess cash flow in the Public Option scenario ranges from \$349 million (at a discount rate of 8.75%) to \$728 million (at a discount rate of 6.50%). The aggregate benefit of the present value of bond issues and excess cash flow over the 50 year analysis period is estimated between \$2.185 billion (discounted at 8.75%) and \$2.564 billion (discounted at 6.50%).

The ongoing value achieved in this scenario is based on future operating decisions to implement certain cost savings initiatives and realize operations and maintenance efficiencies.

A summary of the Public Option scenario output is below:

Scenario	Public Option			
Upfront Proceeds (nominal)				
Upfront Payment (Year 1)	\$1,003m			
Payment from Second Issuance (Year 5)	\$1,064m			
(PV of Second Issuance @ 5%)	\$833m			
Defeasance Cost	-			
IRS Penalty *	-			
Net Proceeds (5 years) (nominal in years 1 and 5)	\$2,067m			
Operating Cash Flow Participation				
Public Participation Method	Excess Cashflow (First Loss)			
First Loss Discount Factor	6.50%	7.25%	8.00%	8.75%
Present Value of First Loss Cash Flow	\$728m	\$566m	\$443m	\$349m
Total Upfront Proceeds and Operating Cash Flow Participation				
Present Value of Upfront Proceeds and Operating Cash Flow ⁽¹⁾	\$2,564m	\$2,402m	\$2,279m	\$2,185m
Capital Structure				
New Debt Issuance	\$2,388m			
Equity	N/A			
Post Tax Equity IRR	N/A			
Debt: Equity Ratio	N/A			
Average Life of Debt	28 Yrs			

Implementation

The initial financing under the Public Option could be implemented in under a year, assuming a decision to proceed with the Public Option is made in December 2012. However, future increases in borrowing capacity would be conditioned upon achieving increased O&M efficiencies as described earlier in this report. Below is a timeline that outlines some of the critical actions that would be required to implement the initial financing under the Public Option. If the State selects a variation of the Public Option, the steps and dates in the timeline for implementing that approach would be modified.

Timeline	Action
December 2012	Decision to pursue the Public Option
December 2012 – January 2013	Conduct legal analysis for legislative purposes
December 2012 – February 2013	Draft legislation, including provisions such as: <ul style="list-style-type: none"> ■ Use of proceeds ■ Ongoing net revenue transfers
February 2013	ODOT budget bill introduced with new legislation included
April 2013	<ul style="list-style-type: none"> ■ ODOT budget bill passed
March – August 2013	<ul style="list-style-type: none"> ■ Develop plan of finance ■ Develop new Master Trust Indenture ■ Develop comprehensive plan for Turnpike operations and maintenance ■ Investment grade Traffic & Revenue study

Timeline	Action
April 2013 – Ongoing	Implement Turnpike operations and maintenance policies and programs in coordination with ODOT
September 2013 -Ongoing	Rating agency updates
October 2013	Initial bond issue

Public-Private Option

The analysis of the Public-Private Option is based on the following assumptions and cost estimates.

Assumptions

- ODOT and OBM, acting pursuant to statute, will lease the Turnpike to a Concessionaire for a maximum 50-year term;
- The concession lease will grant the “Concessionaire” the right to collect and retain project revenues, including tolls, for the full term, in return for its performance obligations to operate and maintain the Turnpike to ODOT standards, as well as to reinvest in the asset as required to meet long-term performance standards. It will also require the Concessionaire to “hand back” the Turnpike to the State at the end of the term in conditions pre-established in the agreement;
- Cash toll rate increases will be capped at the change in CPI;
- ETC toll rates will increase to match cash toll levels within the initial five years, followed by annual increases capped at the change in CPI;
- ETC toll rates for Local Trips will be held constant for 10 years;
- The State will receive an upfront payment and a gross revenue share over the life of the contract; and
- All outstanding tax-exempt Turnpike bonds will be defeased.

Estimates and Model Inputs

- Private operational cost would average approximately 41% less than current Turnpike operations, as estimated through detailed technical analyses. Efficiencies stem from:
 - Eliminating OTC administration costs; and
 - Reduced staffing levels associated with private sector operator for all functions: toll collection, road maintenance, and service plaza operation. Staffing cost model inputs were based on other toll road concession operations such as the Indiana Toll Road.
- By reducing toll transaction costs and accelerating E-ZPass adoption, rationalizing service levels, and implementing operating efficiencies, a private Concessionaire is estimated to spend approximately \$42 million per year (2012 dollars) to operate and maintain the Turnpike, excluding service plazas;

- Concessionaire capital costs for major pavement, bridge and other areas of investment will be approximately 10 percent lower than OTC costs due to private sector efficiencies in procurement, such as design-build contracting, and economies of scale in areas such as equipment and material purchasing; and
- The Concessionaire would spend approximately \$2.9 billion (2012 dollars) on capital improvement projects excluding service plazas, over a 50 year evaluation period. Performance based requirements incorporated into the concession agreement would reflect ODOT standards.

Qualitative Considerations

The Analysis identified a number of benefits and considerations of the Public-Private Option as noted below:

Public-Private Option	
Benefits	Considerations
<ul style="list-style-type: none"> ■ Strong market interest currently exists for a potential Turnpike concession. ■ The State retains control through an enforceable concession contract. ■ The Concessionaire assumes comprehensive project performance risks. ■ The Concessionaire would be estimated to invest over \$2.9 billion (2012 dollars) in capital improvements. ■ The State benefits throughout the contract period from a 15% gross revenue share, paid prior to operations and maintenance costs. ■ The State is not directly responsible or at risk for the Concessionaire's financing. 	<ul style="list-style-type: none"> ■ The State is contractually bound for the full concession term, estimated to be 50 years. ■ The Concessionaire's objective is to maximize returns, which may run counter to certain stakeholder interests. ■ The State would incur an estimated \$234 million of defeasance escrow inefficiencies and related IRS penalties. ■ The Concessionaire would be authorized to impose annual toll increases capped at CPI.

Financial Results

The results of the Public-Private Option are summarized below. The ODOT-preferred scenario included a 15% gross revenue share, local ETC toll freeze for ten years, and non-local ETC equalization to cash tolls by the end of the initial five year period. This scenario also assumed greater ETC penetration than the Public Option.

Assuming these parameters, the Public-Private Option would yield an estimated gross upfront concession payment of \$2.624 billion. After establishing a defeasance escrow for a cost of approximately \$735 million and the IRS Penalty Payment of approximately \$65 million, the State would net approximately \$1.824 billion of up-front concession fee proceeds. In addition, the State is estimated to receive between \$1.477 billion and \$2.206 billion of present value gross revenue share receipts (discounted at 3.5% to 5.0% annually) over the 50 year evaluation period. The gross revenue share also includes the present value of "Other Retained Revenue", which includes leases, and licenses, advertising, and oil and gas

royalty income. In total, ODOT would be expected to net between \$3.301 billion and \$4.030 billion over the life of a 50 year concession lease.³⁸

A summary of the Public-Private Option analysis output is below:

Scenario	Public – Private Option			
Upfront Proceeds				
Upfront Payment	\$2,624m			
Defeasance Cost	(\$735m)			
IRS Penalty *	(\$65m)			
Net Proceeds	\$1,824m (Year 1)			
Operating Cash Flow Participation				
Revenue Share	15% Gross Revenue Share & Other Retained Revenue			
Revenue Share Discount Factor	3.5%	4.0%	4.5%	5.0%
Present Value of Gross Revenue Share & Other Retained Revenue **	\$2,206m	\$1,921m	\$1,680m	\$1,477m
Total Upfront Proceeds and Operating Cash Flow Participation				
Present Value of Upfront Proceeds and Operating Cash Flow	\$4,030m	\$3,745m	\$3,504m	\$3,301m
Capital Structure				
New Debt Issuance	\$1,968m			
Equity	\$937m			
Post Tax Equity IRR	11.0%			
Debt: Equity Ratio	68:32			

Implementation Timeline

The Public-Private Option could be implemented over a period of approximately 14 months. Assuming a decision to proceed with the Public-Private Option is made in December 2012 financial close of the transaction and defeasance would be estimated to be complete by February 2014. Implementing a concession contract with a private Concessionaire would require a variety of key steps, including legislative action granting the approval of the terms and conditions of the procurement document, issuing requests for qualifications and proposals, short listing bidders, evaluating proposals, completing the defeasance of the outstanding Turnpike debt, and achieving commercial and financial close. Below is a timeline that outlines some of the critical actions to implement the Public-Private Option.

Timeline	Action
December 2012	Decision to pursue the Public-Private Option
December 2012	OBM Director submits “Draft of the Invitation Document” and Material Terms and Conditions
December 2012 – February 2013	Legislature acts by resolution to approve “Draft of the Invitation Document” and the Material Terms and Conditions
February 2013	RFQ issuance

³⁸ IRS Penalty payable if concession payment is received over time, which is assumed with the gross revenue share scenario.

Timeline	Action
April 2013	Short List Qualified Bidders
April – June 2013	Draft RFP Industry Review Phase
June 2013	<ul style="list-style-type: none"> ■ RFP Issuance ■ OBM Director publishes Notice of Intent to enter into contract 20 days prior to the RFP response deadline
November 2013	<ul style="list-style-type: none"> ■ RFP responses due ■ Evaluation of bids ■ Select preferred proponent
December 2013	Commercial Close
February 2014	<ul style="list-style-type: none"> ■ Financial Close ■ Defeasance of outstanding Turnpike debt

As stated previously, this Analysis evaluates a variety of discrete scenarios which each contain a large number of assumptions, cost and revenue estimates. A wide range of variations of these scenarios are possible, and the results of any modified scenarios may differ significantly from the above analyses and summaries.

Appendix

Appendix I: Bond Defeasance Considerations

The OTC has approximately \$566 million of outstanding tax exempt toll revenue bonds as of December 1, 2012. All bonds are secured by net toll revenues of the Ohio Turnpike. If the State chose to transfer the rights to toll revenues to a private entity in return for a concession payment pursuant to a concession contract, it would be necessary to defease the outstanding bonds. The State's legal advisors, Barnes & Thornburg, provided considerable input regarding the bond defeasance process and its application to the outstanding Turnpike bonds discussed in the Analysis.

Under IRS guidance, defeasance requires the establishment of an escrow account funded with sufficient State and Local Government Series ("SLGS") securities to pay interest and principal on the outstanding bonds until their maturity date or earliest redemption date. Based on current SLGS rates this results in "negative arbitrage" between the amount of interest that can be earned on the SLGS and the interest due on the outstanding bonds of approximately \$169 million, requiring an estimated amount of \$735 million to be deposited to escrow for a full defeasance.

The OTC's outstanding bonds include:

Series	Amount (\$000s)	Maturity	Earliest Call Date
1998A	\$298,575	02/15/2026	Non-Callable
2001B	\$16,100	02/15/2013	Non-Callable
2009A	\$120,325	02/15/2024	02/15/2019 @100%
2010A	\$131,290	02/15/2031	02/15/2020 @100% ³⁹
Total Outstanding	\$566,290		

Voluntary Closing Agreement – "IRS Penalty Payment"

Under the Public-Private Option, if the State desires to receive a portion of its participation over time, the interest on the current outstanding OTC bonds (with the possible exception of the 2001B bonds, which will mature on 02/15/2013) would be subject to federal taxation retroactively to their dates of issuance. In order to defease the outstanding Turnpike bonds without causing the above treatment, the OTC would be required to enter into a Voluntary Closing Agreement with the IRS pursuant to IRS Rev. Proc. 97-15 and pay a penalty payment ("IRS Penalty Payment").

If the State did not receive a portion of the proceeds over time and all proceeds were received upfront, a single upfront concession payment may be eligible to be placed into escrow, allowing the State to fund a multi-year program, while retaining the State's ability to utilize alternative remedial actions available under the U.S. Treasury Regulations, and thereby potentially avoid the voluntary closing agreement with the IRS.

Pursuant to a Voluntary Closing Agreement, the OTC would be required to pay the United States Treasury an amount known as the IRS Penalty Payment, approximately equal to the aggregate of the following two components: 1) the present value of 29% of the interest due on all the outstanding Turnpike

³⁹ Except for the bonds maturing on 02/15/2027, which are non-callable.

bonds in each calendar year, commencing on the date of financial close and ending on the final maturity date or earliest call date of the outstanding Turnpike bonds, as the case may be (the “Tax-Exempt Amount”); and (2) the present value of 0.14% of the principal amount of the outstanding Turnpike bonds that will be outstanding on January 1 of each calendar year commencing the calendar year of the date of financial close and ending the first calendar year in which the bonds will no longer be outstanding (the “AMT Amount”). The Tax-Exempt Amount relates to the excludability of the interest on the outstanding Turnpike bonds from the gross income of the holders thereof for federal income tax purposes. The AMT Amount relates to the interest on the outstanding Turnpike bonds not being treated as an item of tax preference for purposes of the alternative minimum tax.

It would be necessary that the State pay the IRS Penalty Payment on all outstanding Turnpike bonds, not simply the non-callable bonds or those series with a call date of greater than 10.5 years, in order to receive an ongoing revenue share over the term of any P3 agreement.

Due to the fact that the State may have no other financially feasible remedial actions available, the IRS Penalty Payment is calculated on all of the interest and principal payments on the outstanding bonds until the earliest optional redemption date. If the series does not have an optional redemption date (i.e. is non-callable), then the IRS Penalty Payment is calculated on all interest and principal payments through final maturity of the non-callable series. The Series 1998As and the Series 2001Bs are non-callable, while the Series 2009As and the majority of the Series 2010As have optional redemption dates of 2/15/19 and 2/15/20, respectively. One maturity (2027) of the 2010As also is non-callable.

In order to calculate the approximate amount of that portion of the IRS Penalty Payment consisting of the Tax Exempt Amount, it is necessary to first determine the amount of interest accruing on the bonds of each series in each calendar year, commencing on the date of financial close under the P3 agreement and ending on the next redemption date or, if the bonds are not subject to redemption, their maturity date. The calendar year interest amounts determined above are multiplied by 29% to derive the tax amount due.

Finally, that portion of the IRS Penalty Payment consisting of the Tax-Exempt Amount is the sum of the present value of each of the tax amounts due, determined in the preceding step for each calendar year, assuming it is paid on April 15 in the following calendar year.

Thus, under this formula, as a result of the bonds paying interest on February 15 and August 15 of each year, approximately 75% of the interest due on a February 15 interest payment date would be allocated to the preceding calendar year and 25% would be allocated to that calendar year. Of course, all of the interest due on an August 15 interest payment date would be allocated to that calendar year.

By way of illustration, if the date of financial close under the agreement was March 31, 2013, the interest accruing on the bonds from March 31, 2013 through the interest payment date of August 15, 2013, and the interest accruing on the bonds from August 15, 2013, through December 31, 2013, would be allocated to 2013 and would be assumed to be paid on April 15, 2014. That amount would be multiplied by 29% and discounted back to the financial close date at the Applicable Federal Rate (“AFR”) (see below for details of the AFR).

Then in 2014, the aggregate of the interest accruing on the Bonds:

1. From January 1, 2014, through the interest payment date of February 15, 2014;
2. From February 15, 2014, through the interest payment date of August 15, 2014; and
3. From August 15, 2014, through December 31, 2014, would be allocated to 2014 and would be assumed to be paid on April 15, 2015.

That amount would be multiplied by 29% and discounted back to the financial close date at the taxable AFR. This would be done for each of the following calendar years until the earlier of the redemption date or the maturity date and the sum of those present valued amounts for each calendar year would approximately equal that portion of the IRS penalty payment consisting of the Tax-Exempt Amount.

AMT Amount. In order to calculate that portion of the IRS Penalty Payment constituting the AMT Amount, it is first necessary to determine the aggregate principal amount of each series of outstanding Turnpike bonds that will be outstanding on January 1 of each calendar year commencing the calendar year of the date of financial close and ending the first calendar year in which each series of the outstanding Turnpike bonds will no longer be outstanding.

Next, multiply the amounts determined above for each calendar year by 0.14%. Then, determine the present value of each amount determined in the preceding step for each calendar year by assuming it is paid on April 15 in the following calendar year. Finally, determine the sum of the present value amounts determined in the preceding step for all calendar years.

By way of illustration, if the date of financial close was March 31, 2013, the principal amount of the outstanding Turnpike bonds as of January 1, 2013, would be multiplied by 0.14%. That product would be assumed to be paid on April 15, 2014, and would be present valued to March 31, 2013. Then, in 2014, the aggregate principal amount of the outstanding Turnpike bonds as of January 1, 2014, would be multiplied by 0.14%. That product would be assumed to be paid on April 15, 2015, and would be present valued to March 31, 2013. This is done for each of the following calendar years and the sum of those present valued amounts for each calendar year would approximately equal the AMT Amount.

The discount rate used to determine present value is the taxable AFR determined as of the date of financial close, for a term equal to the period between the date of financial close and the date specified in the voluntary closing agreement with the IRS, which presumably is the next redemption date or, if such outstanding Turnpike bonds are not subject to redemption, their maturity date.

Applicable Federal Rate ("AFR"). In order to calculate the present value of the future obligations, and therefore the IRS Penalty Payment, the future tax requirements are discounted at the appropriate AFR. These rates change from month-to-month and vary depending on the timing of when interest is payable. The semi-annual AFRs for October 2012 for short, medium, and long term periods are 0.23%, 0.93%, and 2.35%, respectively.

The following estimated IRS penalty payments for each series are based on the assumption that the date of financial close under the agreement is January 1, 2013 and that the AFR rates described above will be the same in January 2013:

	Present Value of 29% of Future Interest Payments Until the Earlier of the First Call Date or Final Maturity ⁴⁰	Present Value of 0.14% of the Principal Balance Outstanding Until the Earlier of the First Call Date or Final Maturity	Total IRS Penalty Payment
Outstanding Series	(\$'000s)	(\$'000s)	(\$'000s)
1998A	\$35,665	\$3,301	\$38,965
2001B	\$128	\$22	\$151
2009A	\$7,489	\$1,028	\$8,517
2010A	\$15,413	\$1,561	\$16,974
Total Penalty	\$58,694	\$5,913	\$64,607

If the State chooses to receive a single upfront payment it need not enter into a Voluntary Closing Agreement with the IRS and would therefore avoid paying the IRS Penalty Payment.

Remedial Action

If the State were to receive a single upfront payment, remedial action would be available as an alternative to the IRS Penalty Payment pursuant to a Voluntary Closing Agreement. If the State receives payment over time, the State would be required to pay the IRS Penalty Payment pursuant to a Voluntary Closing Agreement.

To calculate the impact of the remedial action, the proceeds from an upfront payment need to be allocated in a specific fashion. The upfront payment would be allocated to: (1) Series 1998A Bonds and the 2027 Maturity of the Series 2010A Bonds, (2) Other Outstanding Bonds, (3) Redeemed New Money Bonds, and (4) Turnpike Equity (collectively, the “Components”) which are allocated in different amounts depending on the amount of the upfront payment).

Series 1998A Bonds and the 2027 Maturity of 2010A Bonds. Series 1998A Bonds and the 2027 Maturity of Series 2010A Bonds are the only non-callable maturities currently outstanding of the outstanding Bonds. This portion of Bonds is classified here as the “Bad Bonds” because they are not callable within 10.5 years of their date of issuance, as are the rest of the outstanding Bonds. This classification of the bonds determines for what purpose the proceeds allocated to these bonds from the upfront payment can be used.

Other Outstanding Bonds. Other Outstanding Bonds include all other current outstanding OTC bonds exclusive of the Series 1998A Bonds and the 2027 Maturity of Series 2010A. This includes the 2001B Bonds, 2009A Bonds and the 2010A Bonds except for the 2027 maturity.

Redeemed New Money Bonds. Redeemed New Money Bonds are bonds that have been previously issued by the OTC and have also been paid off in full, however, not through a refunding issue. If the

⁴⁰ The present value discount rates are calculated based on the Applicable Federal Rates (“AFR”) which are updated on a monthly basis; The AFRs used herein are those of October 2012.

bonds were paid off through a refunding issue, then the bonds would only become Redeemed New Money Bonds once the refunding issue which refunded the bonds was paid off in full.

Turnpike Equity. Turnpike Equity includes cash expenditures by OTC on capital maintenance for the Turnpike over the last 20 years, depreciated on a straight-line basis over 20 years. Money spent on capital expenditures that derived from a debt issuance does not fall under the definition of Turnpike Equity.

Series 1998A and the 2027 maturity of the Series 2010A are allocated separately and cannot be defeased by the monies allocated to them because they are not redeemable within 10.5 years of issuance. Monies allocated to Series 1998A and the 2027 maturity of Series 2010A must be spent on capital expenditures within two years of project close. Monies allocated to Redeemed New Money Bonds and Turnpike Equity or excess allocation to Other Outstanding Bonds must be used to defease Series 1998A and Series 2010A (2027 maturity) bonds. The value of this series and maturity is \$299 million and \$19 million, respectively.

The Other Outstanding Bonds includes Series 2001B, Series 2009A, and Series 2010A (except the 2027 maturity). These series and maturities are redeemable within 10.5 years of issuance, therefore can be defeased with the monies allocated to them. Any excess monies allocated to Other Outstanding Bonds can be used for any purpose, included defeasing Series 1998A and Series 2010A (2027 maturity) bonds. The value of these bonds is \$248 million.

Any monies allocated to Redeemed New Money Bonds can be used for any purpose, including defeasing Series 1998A, and Series 2010A (2027 maturity) bonds. There have been \$591 million in Redeemed New Money Bonds over the life of the Turnpike.

Any monies allocated to Turnpike Equity can be used for any purpose, including defeasing Series 1998A, and Series 2010A (2027 maturity) bonds. The value is \$517 million.

Upfront Payment Allocation

There are three possible situations regarding the allocation of the upfront payment on the amount of the upfront payment:

- The upfront payment is less than the value of all outstanding bonds (\$566 million);
- The upfront payment is greater than the value of all outstanding bonds (\$566 million), but less than the value of all the Components (\$1,674 million); or
- The upfront payment is greater than the value of all of the Components (\$1,674 million).

Upfront payment less than \$566 million. If the State receives an upfront payment of less than \$566 million, the value of all the Bonds, the upfront payment will be allocated to the outstanding bonds on a pro-rata basis. No allocation will be made to Redeemed New Money Bonds or Turnpike Equity.

Upfront payment greater than \$566 million and less than \$1,674 million. If the State receives an upfront payment of greater than \$566 million, the value of all the Bonds, but less than \$1,674 million, the value of all of the Components, there are two steps to allocating the proceeds from the upfront payment. First, the payment is allocated to all outstanding bonds equal to their value (e.g., allocate \$16.1 million to Series 2001B). Next, any monies remaining after the first allocation is allocated to Redeemed New Money Bonds and Turnpike Equity on a pro-rata basis.

Upfront payment greater than \$1,674 million. If the State receives an upfront payment of greater than \$1,674 million, the value of all of the Components, the payment is allocated to all Components on a pro-rata basis.

Scenario A Upfront payment less than the value of all the outstanding bonds	Scenario B Upfront payment greater than value of <u>all</u> outstanding bonds, but less than the value of all the Components	Scenario C Upfront payment is greater than the value of all the Components
Allocate payment to all outstanding bonds (Series 1998A and Series 2010A, 2027 maturity, Bonds and Other Outstanding Bonds, on a pro-rata basis	First, allocate payment to all outstanding bonds Second, allocate remainder to Turnpike Equity and Redeemed New Money Bonds, on a pro-rata basis	Allocate payment to all Components on a pro-rata basis

Minimum Upfront Payment to Avoid Contributing Additional Monies

Based on the bond defeasance considerations outlined above, an upfront payment of at least \$1,042 million would be required to fully defease all outstanding Turnpike bonds without being forced to use other funds to defease the Series 1998A Bonds and 2010A (2027 maturity only) Bonds. If the upfront payment is less than \$1,042 million, the State will be required to provide additional equity to fully defease all outstanding bonds. If the upfront payment is greater than \$1,042, the State will have additional funds for any other use. Below are some examples of the allocations of upfront payments and each payment's sources and uses.

Upfront Payment Summary – Preliminary							
\$millions	Amount Outstanding	Percentage Allocation	Upfront Payment Allocation				
			\$500	\$1,042	\$1,500	\$2,420	\$3,500
Turnpike Equity	517	30.9%	-	222	436	747	1,081
Redeemed New Money Bonds	591	35.3%	-	254	498	854	1,235
Series 1998A	299	17.8%	264	299	299	431	624
Series 2010A (2027 maturity)	19	1.2%	17	19	19	28	40
Other Outstanding Bonds	248	14.8%	219	248	248	359	519
Total (excluding Defeasance Costs)	1,675	100.0%	500	1,042	1,500	2,420	3,500

Sources and Uses					
\$m	Upfront Payment				
	\$500	\$1,042	\$1,500	\$2,420	\$3,500
Sources					
Concession Payment	500	1,042	1,500	2,420	3,500
Additional Equity	505	-	-	-	-
Total Sources	1,005	1,042	1,500	2,420	3,500
Uses					
Capital projects within 2 years	281	318	318	459	664
Defeasance	566	566	566	566	566
Cost of Defeasance	158	158	158	158	158
Any other use	-	-	458	1,236	2,111
Total Uses	1,005	1,042	1,500	2,420	3,500

In the \$500m example, the State must contribute \$505 million of additional equity in order to successfully defease all outstanding bonds.

In the examples where the upfront payment is greater than \$1,042 million, there are additional proceeds available for any use.

Appendix II: Valuation of Future Cash Flows

Public Sector Discount Rate

The State has determined that for the purposes of the Analysis, the hypothetical project value of the Status Quo with Increased Bonding Capacity and Public Options are defined as: the amount of excess bond proceeds at a theoretical financial close date plus the present value of excess cash flows over the term of the Project.

To assess the value of the excess cash flows expected over the life of the Project, these cash flows should be discounted at a rate that reflects the time value of money and the risks associated with the ultimate realization and collection of these cash flows.

There are two generally accepted alternatives to developing discount rates commonly used in the valuation of toll roads:

- Market Comparables Approach
- Capital Asset Pricing Model ("CAPM") based approach

Market Comparables Approach

The market comparables approach involves an assessment of publicly disclosed transactions and market rates of return to assist in determining the return expectations that should be applied to the target project. The use of market comparable returns provides objective support for the market perception of the risks associated with the transaction, including an assessment of how those risks should be priced and ultimately reflected in the value of the project.

Given that the Ohio Turnpike has a long history of operations as a tolled facility, U.S.-based brownfield toll road transactions appear to form the most relevant basis for establishing the market's return expectations for the Project. With their long-standing history of operations as tolled facilities, the PR-22 and PR-5 toll roads, the Chicago Skyway, and the Indiana Toll Road could be considered analogous transactions to the Ohio Turnpike. Using the market comparables approach, an equity return in the range of 10.80% (representing the projected Equity IRR on the Chicago Skyway) to 15.0% (representing the projected Equity IRR on the PR-22 and PR-5 project) can be used as the most applicable base estimates for establishing expected equity returns. The mid-point of this range is 12.90%.

By using the midpoint of this range and adjusting for risks that are unique to the Turnpike project, the market comparables approach yielded a rate of 11.40%.

Adjusted Discount Rate – Market Comparables Approach	
Equity rate of return (mid-point of range) ⁴¹	12.90%
Adjustment of T&R forecasting risks	(0.25%)
Adjustment for difference in financial leverage	(1.00%)
Adjustment for transferred risks	(0.25%)
Adjusted discount rate	11.40%

⁴¹ For established brownfield projects.

Capital Asset Pricing Model Approach

A CAPM based approach uses the concept that investors in a project must be compensated in two ways: the time value of money and the risk of the cash flows. The CAPM based approach relies on market data and statistics to help quantify how investors should be compensated for the risk they are accepting. The following are components of the CAPM and the assumptions made to derive the cost of equity from this approach:

- Risk free rate of return
- Beta
- Equity risk premium
- Project-specific risk premium

As illustrated in the graphic below, applying the CAPM approach leads to a cost of equity of 7.38% – 9.63%.

Cost of Equity Calculation		
	Low	High
Risk-free rate ⁴²	3.00%	3.00%
Market equity risk premium	5.00%	5.00%
Beta	0.68	0.68
Project-specific equity risk premium	1.00%	3.25%
After-tax cost of equity	7.38%	9.63%
Implied risk premium	4.38%	6.63%

Summary

The discount rate that should be applied to the excess cash flows of the Ohio Turnpike has been evaluated using both the Market Comparables and CAPM methodologies. Both methodologies are commonly applied in practice and represent a logical approach to estimating a discount rate that appropriately reflects the risks associated with an investment in the Turnpike.

Based on the analysis outlined above and further discussion with the State, a discount rate range of 6.50% to 8.75% is assumed when determining the present value of the excess cash flows from the Turnpike in the Status Quo with Increased Bonding Capacity and the Public Option. This specific range

⁴² Risk free rate based on 30-year US Treasury bond (as of September 19, 2012).

was determined through discussions with the State and comparison to both the CAPM based approach and the market comparables approach.

Private Sector Discount Rate

The discount rate that has been used to evaluate the gross revenue share for the private sector has been determined by the quality of the cash flows that flow directly from the gross revenue share agreement. Given that the cash flows from the gross revenue share are of a high credit quality with regard to the flow of funds, there is high certainty that the State will receive its portion of the gross revenue share agreement. The only relevant risk to the gross revenue share being delivered to the public sector is traffic and revenue risk. Given the traffic and revenue risk, the cash flows from the gross revenue share, while a very strong credit, have an incrementally greater risk than a AAA credit. Therefore, a proxy for the discount rate of the cash flows of the gross revenue share would be the AAA 30-year MMD rate, with an added spread to account for the individual risk of the cash flows. The AAA 30-year MMD has been approximately 3.0% over the analysis period, thus adding on 100 basis points to account for the traffic and revenue risk results in a 4.0% discount rate. A range of discount rates were used between 3.5% and 5.0% to provide an indication of the likely gross revenue share net present value.

Appendix III: Rest Area Case Studies

In recent years, departments of transportation and tolling authorities have explored new ways to operate, maintain, and improve service plazas, including engaging in long term master concessions. This section analyzes a selection of long-term service plaza concessions in other states, highlighting best practices relevant to Ohio. Examples include terms of operator contracts, approaches to financing capital improvements, and examples of successfully implemented public-private partnerships that can inform potential scenarios for further analysis. Case studies looked at the following service plaza concessions:

- Pennsylvania Turnpike
- Florida Turnpike Enterprise
- Maryland I-95 service plazas

Pennsylvania Turnpike

In 2004, the Pennsylvania Turnpike issued a Request for Proposals (“RFP”) to redevelop and modernize all of its 21 service plazas under a long-term agreement with a private partner structured in a way that would not require the use of toll revenue⁴³. At that time, service plaza revenue represented two percent of total turnpike revenue, but the plazas were antiquated and most were in need of complete reconstruction.

The Pennsylvania Turnpike signed a 30-year contract with HMS Host and Sunoco which called for the commitment of \$170 million in private investment, including \$100 million from HMS Host for the restaurant/retail components of the service plazas and \$70 million from Sunoco for fuel station reconstruction.

Prior to the long-term agreement, the Pennsylvania Turnpike was engaged in a more conventional short-term concession with HMS Host, and received 9% of gross sales revenue. In exchange for the commitment to rebuild all of the service plazas, HMS Host agreed to pay 4.5% of gross sales to the Turnpike until all plazas were renovated, then 4% over the remaining 30-year lease period⁴⁴. Under the old contract, the Turnpike handled most maintenance such as plowing and surface lot repair, but, under the new agreement, HMS Host now handles the majority of this type of expense under the long-term concession.

Although the Turnpike receives a smaller share of gross sales, the Turnpike projects that it will receive revenues on par with the previous short-term concession as a result of the improvements to the facilities and forecasted growth in total sales. Total sales are estimated to be \$3.5 billion over the 30-year period.



Because the service plazas have differing traffic volumes yielding a variety of retail and fuel demand potential, HMS Host proposed three different service plaza design formats, which varied by square

⁴³ Presentation entitled “Pennsylvania Turnpike Commission - Service Plazas Privatization and Reconstruction,” at NCSL Fall Forum, December 10, 2010, by Eric Bugaile, Executive Director, Pennsylvania House Transportation Committee

⁴⁴ “Lease between Pennsylvania Turnpike Commission and Hmshost Family Restaurants, LLC”

footage to best match this demand potential. These designs consisted of an 8,000-square-foot model for the smallest plaza, a 14,000-square-foot format for the majority of plazas, and three 21,500-square-foot plazas for the highest volume areas⁴⁵.

The average size for the Pennsylvania Turnpike service plazas is 15,000 square feet, with average daily traffic for all Pennsylvania service plazas at 18,500 (2003)⁴⁶.

Due to the long-term nature of the concession, fluctuations in the economy have had an impact on the timing of service plaza delivery. Although the concession agreement called for a construction schedule to outline the timeline of service plaza reconstruction, HMS Host requested the postponement of the construction of four service plazas during the last recession. The Turnpike was unwilling to allow nothing to be built that year but did agree to allow the postponement of two of the four service plaza reconstructions⁴⁷. This scenario suggests that although the concession was designed to transfer economic and construction risk to the private partner, in a period of particularly weak economic conditions, the Pennsylvania Turnpike was still somewhat exposed in the form of delayed service plaza delivery.

Florida's Turnpike Enterprise

In 2009, Florida's Turnpike Enterprise (FTE) entered into a 30-year concession with Areas USA to renovate, rebuild, and operate the eight service plazas on the 300-mile toll road. The concession includes a \$162-million capital commitment to rebuild some of the service plazas and renovate others, which were originally built in the 1950s and 1960s and renovated in the 1980s. In addition to the capital commitment, FTE will be guaranteed \$180 million over the life of the contract.⁴⁸

Changes to the service plazas include tailoring them for the different types of customers that frequent them in different locations. The original service plazas were all the same size and format but two of the most visited service plazas were experiencing up to three times the demand as the others. Restaurant brands and amenities are expected to differ for those service plazas more commonly visited by commuters versus others that experience more tourist-oriented demand. Brand selection also factors in local surveys of consumer preferences, which resulted in a switch from Starbucks to Dunkin' Donuts and healthier and more diverse food options⁴⁹.



Maryland I-95 Service Plazas

The State of Maryland recently announced a long-term concession to rebuild and operate two large service plazas located on Interstate 95. Although the highway is not tolled in Maryland, The Chesapeake House and the Maryland House are state-operated service plazas that are “grandfathered,” meaning they were in existence prior to the federal law prohibiting states from operating commercial services on federally funded highways.

⁴⁵ Lease between Pennsylvania Turnpike Commission and Hmshost Family Restaurants, LLC

⁴⁶ Pennsylvania Turnpike Commission

⁴⁷ Based on interview with former Pennsylvania Turnpike Employee

⁴⁸ http://www.floridasturnpike.com/PressReleases/FloridaTurnpikeAwardsConcessionContract_06-04-09.pdf

⁴⁹ <http://www.examiner.com/article/dunkin-donuts-replaces-starbucks-on-florida-s-turnpike>

The agreement entails a 35-year concession with Areas USA, in which the private partner will completely rebuild and enlarge both service plazas at an estimated cost to Areas of \$56 million. Payments to Maryland will range from \$442 million to \$488 million over the term, reflecting the sizable retail and fuel sales potential of the two service plazas. The Maryland House will be expanded from 459 seats to 912 while the Chesapeake House will increase from 343 to 405 seats⁵⁰.



Payments to Maryland will be based on a sliding scale of share of gross food, fuel, and convenience store sales. Maryland will receive 10 percent for annual sales up to \$45 million which can increase up to 15 percent for sales greater than \$75 million. For fuel, Maryland will receive a share ranging from 5 to 9 cents per gallon for automobile fuel and 7 to 11 cents for diesel. Maryland's share of convenience store sales will range from 9 to 11 percent depending on total sales. The net present value of the capital investments and annual lease payments to Maryland is estimated at \$180 to \$198 million⁵¹.

Maryland also addressed important issues such as environmental remediation and concerns over jobs. The concession calls for Areas to remediate existing soil contamination and completely replace all underground fuel storage tanks. Maryland will contribute funds if the necessary remediation exceeds a certain threshold but Areas accepts responsibility for all future environmental compliance. Areas will address job concerns by attempting to hire as many of the existing service plaza employees as possible. Areas will also explore ways to mitigate displaced workers during temporary closures including private job fairs, outreach, and by arranging on-site service plaza visits from local workforce assistance programs⁵².

⁵⁰ <http://www.tollroadsnews.com/node/5721>

⁵¹ <http://www.i95mdtravelplazas.com/lease-agreement>

⁵² http://www.mdt.maryland.gov/News/Documents/Report_to_Maryland_General_Assembly.pdf